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CATALOGUE

OF

FOSSIL MAMMALIA.

PART I.

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CATALOGUE

OF THE

FOSSIL MAMMALIA

IN THE

BRITISH MUSEUM,

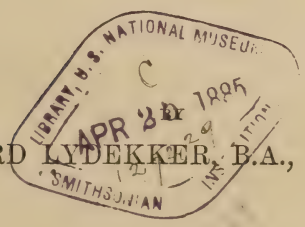
(NATURAL HISTORY)

CROMWELL ROAD, S.W.

PART I.

CONTAINING THE ORDERS

PRIMATES, CHIROPTERA, INSECTIVORA,
CARNIVORA, AND RODENTIA.



RICHARD LYDEKKER, B.A., F.G.S., ETC.

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PREFACE.

The recent removal of the Geological Collections from the overcrowded apartments of the British Museum in Bloomsbury to the new and spacious galleries of the present building, has afforded ample convenience to the scientific staff of the Department to carefully examine and re-arrange the entire Collection—a work upon which they are still engaged, and one that must necessarily occupy many years to complete.

One result of the re-arrangement has been to bring into greater prominence the need, long felt, of a series of Descriptive Catalogues of each class of Fossil Remains, suited to the wants of the scientific worker, in the same manner that it is hoped the Guide-books satisfy the requirements of the ordinary visitor.

The present volume, which has been most carefully prepared by Mr. R. Lydekker, forms Part I. of a series intended to embrace the whole of the Fossil Vertebrata.

Catalogues of other Classes have been already printed or are now in course of preparation; and it is confidently hoped that, before many years have elapsed, similar records of the entire Geological Collection will have been published.

HENRY WOODWARD.

British Museum
(Natural History),
Department of Geology,
January 1, 1885.

INTRODUCTION.

In the present Catalogue I have endeavoured, as far as possible, to follow in the lines laid down by Professor W. H. Flower[1] in respect to the nomenclature of species and genera, and in regard to general systematic arrangement. A larger number of synonyms are, however, introduced, because in the case of fossils there is at present, unfortunately, but little uniformity in nomenclature, and the same species is still quoted by different writers under different designations. In the case of the less frequently employed synonyms references are not always given. For each generic and specific name adopted I have given, as far as possible, the place and date of its first occurrence, and in many of the less perfectly known forms references are added to figures or full descriptions. Great care has been taken in endeavouring to find the proper name of each genus and species.

In regard to systematic arrangement, I have endeavoured to so modify that adopted by Professor Flower as to make it include the host of extinct forms which are here dealt with, as it would be inconvenient to be continually referring groups to an *Incerta sedes*.

In the case of well-known forms very frequently no specific or generic characters are given; but in instances where there are a number of closely allied genera, or a large number of species belonging to one genus, and distinguished by characters which are not always readily apparent, I have frequently added a short notice of some of the more important generic and specific characters which are applicable to fossils. These characters are more fully given in the case of imperfectly known forms; and in some instances individual specimens which are of more than ordinary interest are more or less fully described. Species which still exist are indicated by their names being printed in Old-English characters.

[1] Catalogue of Specimens of Vertebrated Animals in the Museum of the Royal College of Surgeons, part ii. (1884).

There has been some difficulty in deciding on the number of specimens which should be introduced into the Catalogue, since the Museum contains such vast quantities of the remains of some of the commoner species that the introduction of the whole would be utterly useless. In such instances the principle of introducing nearly all the specimens displayed to the public in the cases of the Mammalian Gallery has been adopted, together with such specimens in the drawers as are of interest, either from their intrinsic characters or on distributional grounds.

As far as possible references are given to all works in which individual specimens have been either described or figured. In the case of figured specimens the word (*Fig.*) is placed below the number of the specimen. The specimens are referred to in this Catalogue by their Register numbers. In the majority of cases these numbers are written on oval yellow labels attached to the specimens, the more recent acquisitions being ranged under the letter **M**. In the case of some of the specimens which have been longest in the collection the numbers are written on oblong white labels, these numbers referring to a separate volume known as the "Old Catalogue." Such specimens are entered with the affix **O.C.** to their numbers.

In the present state of science it is almost impossible to render mammalian genera of equivalent value, since some writers regard extremely minute differences as of generic value, while others (among whom is the present writer) use generic terms in a wider sense. Thus, among the Carnivora, the genera *Hyæna*, *Viverra*, and *Cynodictis*, as these terms are employed below, are examples of generic terms used in the latter sense; while some of the other genera of the *Viverridæ* are founded on very small differences[1]. In cases of imperfectly known forms, or those whose existing allies belong to groups very difficult to distinguish merely by those characters available in the case of fossils, the generic terms employed by contemporary writers are very generally retained.

In enumerating the teeth of the typical heterodont eutherian Mammals, each tooth of the cheek-series is referred to its proper position in the complete series, the first premolar always meaning the first tooth in the typical series of four, and so with the succeeding teeth.

[1] Thus, as far as can be judged from the mandible, it seems very doubtful whether *Palæoprionodon* can be distinguished from *Prionodon*.

With regard to geological horizons, I have adopted, after mature consideration, the following classification of the Tertiaries of Europe, which is modified from the tables given by Messrs. Gaudry, Boyd Dawkins, and Max Schlosser. I have included the Pikermi and Mont-Lebéron beds in the Pliocene, but have retained the Eppelsheim beds, which are sometimes classed in the same division, at the top of the Miocene. As regards their mammalian fauna, the Eppelsheim beds seem transitional between the Pliocene and the Miocene. Thus they contain *Dinotherium*, which is common to the Middle Miocene and Lower Pliocene (Pikermi); and likewise *Rhinoceros schleiermacheri*, which ranges from the Middle Miocene of Sansan [1] to the Lower Pliocene of Pikermi, as well as the Middle Miocene *Lutra dubia* [2]. Their affinity to the Lower Pliocene is marked by the commencement of the genera *Hipparion* and *Simocyon*, the Pikermi species of which genera are identical with those of Eppelsheim. Professor Gaudry [3] is also inclined to identify the Pikermi *Aceratherium* with the Eppelsheim *A. incisivum*. The Eppelsheim beds do not, however, contain the highly specialized Ruminants of Pikermi. The probable nearness in time of the Œningen beds to those of Eppelsheim, and the affinity of the mammalian fauna of the former to that of the Middle Miocene of Sansan, tends to connect the Eppelsheim beds with the Miocene. I have discarded the term Oligocene (although its place is shown in the table), as it appears to me to be an unnecessary encumbrance. The Ronzon beds, with which, from the occurrence in both of *Hyopotamus bovinus* [4], the Hempstead beds are associated, are placed at the bottom of the Miocene, while the French phosphorites are placed at the top of the Eocene, as transition beds between the Miocene and Eocene. The mixture of Miocene and Eocene forms in the latter deposits is shown by the circumstance that they contain species like *Cephalogale brevirostris* [5], *Hyænodon vulpinus* [6], *Anthracotherium magnum*, and *Hyotherium typus*, common to the Lower Miocene, and others like *Hyænodon heberti* [7], *Pterodon dasyuroides*, *Palæotherium magnum*, and *P. crassum*, common to the Upper Eocene. The Egerkingen beds of Switzerland are placed in the Upper Eocene, following in this respect the views of Dr. Max Schlosser [8]. They

[1] This is on the assumption that *R. sansaniensis* is specifically the same.
[2] *Vide infrà*, p. 192.
[3] Les Enchaînements, Mam. Tert. pp. 47, 51 (1878).
[4] *Vide* Geol. Mag. dec. 3, vol. i. p. 547 (1884).
[5] *Vide infrà*, p. 147. [6] *Ibid.* p. 28. [7] *Ibid.* p. 21.
[8] Palæontographica, vol. xxxi. p. 96 (1884).

contain *Anthracotherium gresslyi* (Meyer), common to the Headon series of Hordwell[1]. These observations indicate that the terms Pliocene, Miocene, and Eocene cannot be categorically defined, but must merely be regarded as marking stages in geological evolution.

The subvolcanic alluvium of Puy-de-Dôme, from the number of its extinct mammalian forms, is classed at the top of the Pliocene; but it is quite probable that it may really be transitional between the Pliocene and Pleistocene. The ossiferous strata of the typical Siwalik hills of India, the contemporary strata of Burma and China, and part of the Siwaliks of the Punjab are referred to the Pliocene; while the lower Siwaliks of Sind and the Búgti hills may not improbably be referred to the lower part of the same epoch, or may be regarded as transitional between the Pliocene and Miocene. The Narbadas of India are classed with the Pleistocene.

TABLE OF EUROPEAN TERTIARY STRATA[2].

1. UPPER PLIOCENE.
   - *a.* Alluvium of Puy-de-Dôme. / Val d'Arno (in part). / Norwich Crag.
   - *b.* (?) Red Crag (Suffolk, &c.).

2. LOWER PLIOCENE.
   - *a.* Montpellier and Casino (Tuscany). / Coralline Crag (Suffolk).
   - *b.* Pikermi (Attica) and Mont Lebéron (Vaucluse). / Baltavar (Hungary). / Concud (Spain).

3. UPPER MIOCENE.
   - *a.* Eppelsheim (Hesse Darmstadt). / Œningen (Switzerland).
   - *b.* Georgensmünd (Würtemberg).

4. MIDDLE MIOCENE.
   - *a.* Vienna basin (in part).
   - *b.* Eibiswald (Styria). / Käpfnach (Switzerland). / Steinheim (Bavaria). / Sansan and Simorre (Gers). / St. Gaudens (Haute-Garonne). / Grive St. Alban (Isère). / Chaux-de-Fonds (Switzerland).
   - *c.* Montabuzard. / Orléannais. / Monte Bamboli (Tuscany).

5. LOWER MIOCENE.
   - *a.* Weissenau (near Mayence). / Haslach (near Ulm). / Hochheim (near Wiesbaden).
   - *b.* St. Gérand-le-Puy (Allier). / Puy-de-Dôme.

[1] See Lydekker, Geol. Mag. dec. 3, vol. ii. February 1885.

[2] It has not been considered necessary to introduce the Pleistocene.

Lower Miocene (*continued*).	*c.*	Fontainebleau (Seine-et-Marne). Ferte Alais (Seine-et-Loire). Villebramar (Lot-et-Garonne). Lausanne (Switzerland). Cadibona (Italy). Ronzon, near Puy-en-Velay (Haute-Loire). ? Hempstead (Isle of Wight).	
6. Upper Eocene.	*a.*	Quercy phosphorites, Caylux, Mouillac, &c. (Central France). Œrlinger-Thal (Switzerland). Pappenheim, (?) Egerkingen (Switzerland) (in part). Brie (Charente).	Oligocene.
	b.	Paris gypsum. Débruge (Vaucluse). Bembridge (Isle of Wight). Souvignargues (Gard).	
	c.	Beauchamp, New Forest. Headon (Isle of Wight). ? Mauremont (Switzerland) (in part). ? Egerkingen (in part), and Ober-Gösken (in part).	
7. Middle Eocene.		Calcaire Grossier. Argenton (Indre). Issel (Aude). Bracklesham (Sussex).	
8. Lower Eocene.	*a.*	London Clay. Cuyse-la-Motte.	
	b.	Soissonnais.	
	c.	La Fère (Aisne).	

In regard to the history of individual specimens, a large number of them have been obtained from dealers, and these are entered merely as *Purchased,* with the date of such purchase. The same remark applies to many specimens bought at sales; the original ownership of such specimens not being a matter of especial interest. Specimens which form part of Collections of more or less historic value, are entered with the name of the collection to which they respectively belonged. The following list gives some particulars relating to these Collections:—

Bean Collection.—Purchased from Mr. William Bean of Scarborough in 1859.

Brady Collection.—Purchased from Sir Antonio Brady, late of Stratford, Essex, in 1878. Consists of specimens from the Pleistocene deposits of Ilford, Essex; and is described in a Catalogue by Mr. W. Davies, F.G.S., printed for private circulation in 1874.

Bravard Collection.—This collection comprises two portions, both of which were collected by M. Bravard, and were purchased from

him by the Trustees. The first part consists of specimens from the Tertiaries of France, and was acquired in 1852. The second portion is from the Pleistocene of South America; it was collected in 1852 and 1853, and acquired in 1854.

Van Breda Collection.—Purchased in 1871 from the executors of Professor Van Breda of Haarlem.

Brixham-Cave Collection.—Presented through the Council of the Royal Society in 1876.

Brome Collection.—Consists of specimens from the caves of Gibraltar; it was made by Captain F. Brome, sometime Governor of the Military prison at Gibraltar, and was presented through the Governor of Gibraltar in 1876.

Buckland Collection.—Purchased at the sale of the Collection of the Rev. Prof. Buckland, D.D. (Dean of Westminster).

Cautley Collection.—This magnificent collection is entirely made up of specimens from the Siwaliks of India, and was presented by Colonel Sir Proby T. Cautley, K.C.B., in 1842.

Claussen Collection.—Purchased from M. Claussen in 1845 and 1848. It consists of specimens from the caverns and Pleistocene deposits of South America.

Croizet Collection.—Purchased from the Abbé Croizet in 1848 and 1849. This collection comprises specimens from the Tertiaries in the district of the Auvergne.

Egerton Collection.—Purchased from the executors of the late Sir Philip de Malpas Grey Egerton, Bart. (Trustee Brit. Mus.), in 1882.

Enniskillen Collection.—Purchased from the Right Hon the Earl of Enniskillen, D.C.L., in 1882.

Green Collection.—Purchased in 1843 from the Rev. C. Green, of Bacton, Norfolk. Mainly consists of specimens from the Forest-bed of Norfolk and the fens of the adjacent counties.

Hastings Collection.—Purchased from the Marchioness of Hastings in 1855. A collection rich in specimens from the Tertiaries of Hampshire and the Isle of Wight.

Leith-Adams Collection.—Purchased from the late Professor Andrew Leith-Adams, M.D., in 1873. Composed of specimens from the caverns and fissures of Malta.

Owles Collection.—Purchased in 1874 from Mr. J. J. Owles of Great Yarmouth. This collection mainly consists of specimens dredged off the "Dogger-Bank" and the Eastern coast of England.

McEnery Collection.—Purchased in 1842 at Torquay, at the sale of the collection of the Rev. J. McEnery. Mainly a collection of specimens from Kent's-Hole Cavern, Torquay.

Mantell Collection.—This was purchased in two parts: the first from Dr. Gideon A. Mantell in 1836, and the second from his executors in 1853.

Pomel Collection.—Purchased from M. J. Pomel in 1851. The greater part of this collection is made up of specimens from the French Miocene.

Sömmering Collection.—Purchased from Herr Sömmering in 1827.

Spratt Collection.—Presented by Admiral Spratt, C.B., in 1874 and 1878. Exclusively from the caverns and fissures of Malta.

Tesson Collection.—Purchased from M. Tesson in 1857.

Toulmin-Smith Collection.—Purchased in 1869 from the widow of Mr. Toulmin-Smith.

Wetherell Collection.—Purchased from Mr. N. T. Wetherell, of Highgate, in 1871, through Mr. J. Tennant.

The specimens presented by Mr. C. Falconer are from the collection of Dr. Hugh Falconer.

The abbreviations employed for serial publications are in the main those used in the 'Geological Record' for 1878; but an explanation of those used in this part has been appended.

The metrical system is employed for all measurements.

In conclusion, I have to express my best thanks to Mr. William Davies, of the Geological Department of the Museum, for the valuable information he has given me regarding the history of individual specimens, and of the different collections, as well as for some MS. notes. I also owe him thanks for having looked over the proof-sheets of this Catalogue. My thanks are likewise due to Mr. Oldfield Thomas, of the Zoological Department of the Museum, for much valuable assistance in identifying existing species of Mammals, and more especially in the case of the Rodents[1].

RICHARD LYDEKKER.

The Lodge, Harpenden,
Hertfordshire.

Christmas, 1884.

[1] It may not be out of place to observe that, in my work on the Fossil Mammals of India, published in the 'Palæontologia Indica' (Memoirs of the Geological Survey of India), ser. 10, vols. i., ii., and iii., the names employed for several species of European fossil mammals are different from those given in the present work. This is owing to the circumstance that I had not then the time, or in many cases the means, of entering into the question of the right of priority of the names employed, but merely took them on the authority of other writers. Some errors in the authority for various specific names also occur in that work.

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[Where not otherwise stated, the works are in 8vo.]

Abh. k. Ak. Wiss. Berlin.—Abhandlungen der königlichen Akademie der Wissenschaften zu Berlin. 4to. *Berlin.*

Abh. math.-phys. Cl. k.-bay. Ak. Wiss.—Abhandlungen der mathematisch-physikalischen Classe der königlich-bayerischen Akademie der Wissenschaften zu München. *Munich.*

Abh. schweiz. pal. Ges.—Abhandlungen der schweizerischen palæontographischen Gesellschaft. 4to. *Basle.*

Act. Soc. Linn. Bordeaux.—Actes de la Société Linnéenne de Bordeaux. *Bordeaux.*

Amer. Journ.—The American Journal of Science and Arts. *Newhaven* (*U.S.A.*).

Amer. Nat.—American Naturalist.—*Salem, Mass.* (*U.S.A.*).

Ann. d. Muséum.—Annales du Muséum d'Histoire Naturelle à Paris. *Paris.*

Ann. Fr. et Etr. d'Anat. et de Physiol.—Annales Françaises et Etrangères d'Anatomie et de Physiologie, &c., &c. (Laurent). *Paris.*

Ann. Mus. R. Hist. Nat. Belg.—Annales du Musée Royal d'Histoire Naturelle de Belgique. *Brussels.*

Ann. Sci. Géol. Annales des Sciences Géologiques. *Paris.*
The memoirs of Dr. Filhol quoted in this serial are also published in the 'Bibliothèque de l'Ecole des Hautes Etudes,' *Paris.*

Ann. Sci. Nat.—Annales des Sciences Naturelles. *Paris.*

Ann. Soc. Agric. Sci. le Puy.—Annales de la Société d'Agriculture, Sciences, Arts et Commerce du Puy. *Le Puy.*

Ann. Soc. Sci. Phys. Nat. Toulouse.—Annales de la Société des Sciences Physiques et Naturelles de Toulouse. *Toulouse.*

Arch. d. Muséum.—Nouvelles Archives du Muséum d'Histoire Naturelle à Paris. 4to. *Paris.*

Arch. Mus. Lyon.—Archives du Muséum d'Histoire Naturelle de Lyon. 4to. *Lyon.*

Arch. Sci. Phys. Nat.—Bibliothèque Universelle et Revue Suisse.—Archives des Sciences Physiques et Naturelles. *Geneva.*

Archiv für Natur.—Archiv für die gesammte Naturlehre (Kastner). *Nuremberg.*

Asiatic Researches. Calcutta.

Atti Soc. Ital. Sci. Nat.—Atti della Società Italiana di Scienze Naturali. *Milan.*

Bull. Ac. R. Belg.—Bulletin de l'Académie Royale des Sciences, &c. de Belgique. *Brussels.*

Bull. Soc. Géol. France.—Bulletin de la Société Géologique de la France. *Paris.*

Bull. Soc. Philom. Paris.—Bulletin de la Société Philomatique de Paris. *Paris.*

Bull. Soc. Sav.—Bulletin des Société Savantes, &c. *Paris.*

Comptes Rendus.—Comptes Rendus hebdomadaires des Séances de l'Académie des Sciences de l'Institut de France, 4to. *Paris.*

Denkschr. k. Ak. Wiss.—Denkschriften der kaiserlichen Akademie der Wissenschaften. Mathematisch-naturwissenschaftliche Classe. 4to. *Vienna.*

Denkschr. schw. nat. Ges.—Denkschriften der schweizerischen naturforschenden Gesellschaft. 4to. *Various Swiss Towns.*

Gelehrte Anzeigen.—Gelehrte Anzeigen der königlich-bayerischen Akademie der Wissenschaften. *Munich.*

Geol. Mag.—Geological Magazine. *London.*

Isis.—Isis von Oken. 4to. *Leipsic.*

Journ. As. Soc. Beng.—Journal of the Asiatic Society of Bengal. *Calcutta.*

Journ. R. Dublin Soc.—Journal of the Royal Dublin Society. *Dublin.*

Journ. Zool.—Journal de Zoologie. *Paris.*

K. Danske Vid. Selsk. Skr.—Det Kongelige Danske Videnskabernes Selskabs Skrifter, naturvidenskabelig og mathematisk Afdeeling. 4to. *Copenhagen.*

Magazin Encyclopédique.—Magazin Encyclopédique, &c. (Milin). *Paris.*

Mém. Ac. Imp. St. Pétersbourg.—Mémoires de l'Académie Impériale des Sciences de St. Pétersbourg. *St. Petersburg.*

Mém. Ac. R. Belg.—Mémoires de l'Académie Royale des Sciences, &c. de Belgique. 4to. *Brussels.*

Mém. d. Muséum.—Mémoires du Muséum d'Histoire Naturelle à Paris. 4to. *Paris.*

Mém. de l'Institut.—Mémoires de l'Institut de France: Académie des Sciences. *Paris.*

Mem. Geol. Surv. Eng.—Memoirs of the Geological Survey of Great Britain. 8vo and 4to. *London.*

Mem. Geol. Surv. Ind.—Memoirs of the Geological Survey of India. *Calcutta.* (Palæontologia Indica. 4to.)

Monatsb. k. preuss. Ak. Wiss.—Monatsberichte der königlich-preussischen Akademie der Wissenschaften zu Berlin. *Berlin.*

Nature.—Nature, a weekly illustrated Journal of Science. 4to. *London.*

Neues Jahrb.—Neues Jahrbuch für Mineralogie, Geologie und Paläontologie. *Stuttgart.*

Nova Acta Ac. Cæs. Leop.-Car.—Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldino-Carolinæ Germanicæ Naturæ-Curiosorum. *Dresden.*

Nov. Comm. Petrop.—Novi Commentarii Academiæ Scientiarium Imperialis Petropolitana. 4to. *St. Petersburg.*

Palæontographica.—Palæontographica. Beiträge zur Naturgeschichte der Vorwelt. 4to. *Cassel.*

Palæontologia Indica.—See *Mem. Geol. Surv. Ind.*

Pal. Soc.—Palæontographical Society (Monographs of). 4to. *London.*

Phil. Trans.—Philosophical Transactions of the Royal Society of London. 4to. *London.*

Proc. Geol. Soc. W. Riding Yorksh.—Proceedings of the Geological and Polytechnic Society of the West Riding of Yorkshire. *Leeds.*

Proc. R. Dublin Soc.—Scientific Proceedings of the Royal Dublin Society. *Dublin.*

Proc. R. Irish Ac.—Proceedings of the Royal Irish Academy. *Dublin.*

Proc. Zool. Soc.—Proceedings of the Scientific Meetings of the Zoological Society of London. *London.*

Quart. Journ. Geol. Soc.—The Quarterly Journal of the Geological Society of London. *London.*

Rec. Geol. Surv. Ind.—Records of the Geological Survey of India. *Calcutta.*

Rep. Brit. Assoc.—Report of the British Association for the Advancement of Science. *London.*

Report U.S. Geogr. Surv. W. of 100th Meridian.—Report upon United-States Geographical Surveys West of the One-Hundredth Meridian. 4to. *Washington.*

Revue Encyclopédique.—Revue Encyclopédique &c., &c. (Julien). *Paris.*

Trans. Geol. Soc.—Transactions of the Geological Society of London. 4to. *London.*

Trans. Linn. Soc.—Transactions of the Linnean Society. 4to. *London.*

Trans. Zool. Soc.—Transactions of the Zoological Society of London. 4to. *London.*

Zeitschr. deutsch. geol. Ges. — Zeitschrift der deutschen geologischen Gesellschaft. *Berlin.*

Note.—The abbreviations of separate works are readily recognizable, and do not require explanation. Memoirs that appeared in serials are always quoted from such serials, with one or two exceptions, like Pomel's 'Catalogue Méthodique'[1] (Paris, 1853) and H. von Meyer's 'Die fossile Zahne und Knochen von Georgensmund' (Stuttgart, 1834), which originally appeared in serials but are better known as separate volumes.

[1] The first part of this Catalogue appeared in its original form in 1852, in the 'Ann. Sci. Auvergne' (*Clermont-Ferrand*).

CORRIGENDA.

Page 67. In the description of Nos. **40827 a,** and **40827 b,** *transpose* the words *right* and *left.*

Page 74. *For* No. **15436** *read* **15434.**

CATALOGUE

OF

FOSSIL MAMMALIA.

Class **MAMMALIA.**

Subclass EUTHERIA.

Order PRIMATES.

Suborder *ANTHROPOIDEA.*

Family SIMIIDÆ.

Dentition:—I. $\frac{2}{2}$, C. $\frac{1}{1}$, Pm. $\frac{2}{2}$, M. $\frac{3}{3}$.

Genus **DRYOPITHECUS,** Lartet[1].

Dryopithecus fontani, Lartet[2].

Hab. Europe.

40340. Cast of two portions of the mandible. The original was obtained from the Middle Miocene of St. Gaudens (Haute-Garonne), France, and is preserved in the Paris Museum. It is figured by Lartet in the memoir cited, and also by Gervais in the second edition of the 'Zoologie et Paléontologie Françaises,' p. 8. The specimen probably belonged to a female, and is "of the same size as the existing Chimpanzee, though in dental characters more resembling the Gorilla." *Purchased*, 1867.

[1] Comptes Rendus, vol. xliii. p. 219 (1856).

[2] *Loc. cit.*

26491. Cast of the right femur. The original (which is said to be lost) was obtained from the Upper Miocene of Eppelsheim, Hesse-Darmstadt, and is figured by Kaup in the 'Beiträge,' pt. 5, pl. i. figs. 3, 3 *a* (1861). *Purchased*, 1851.

Genus **HYLOBATES**, Illiger[1].

Syn. *Pliopithecus*, P. Gervais[2].

Hylobates antiquus (Blainville[3]).

Syn. *Pithecus antiquus*, Blainville[4].
Pliopithecus antiquus, P. Gervais[5].
Pliopithecus platyodon, Biedermann.

Hab. S. Europe.

29614. Cast of the greater portion of the mandible. The original is from the Middle Miocene of Sansan (Gers), France, and is preserved in the Paris Museum. It is figured by Gervais in the second edition of the Zool. et Pal. Françaises, p. 9. Rütimeyer refers the species to *Hylobates*.
Hastings Collection. Purchased, 1855.

Family CERCOPITHECIDÆ.

Dentition.—The dental formula is the same as in the *Simiidæ*. The cusps on the molars are, however, more strongly developed, and form ridges running directly across the crown.

Genus **SEMNOPITHECUS**, F. Cuvier[6].

Semnopithecus palæindicus, Lydekker[7].

Hab. India.

15710. (*Fig.*) Fragment of the right ramus of the mandible, containing the last premolar and the three true molars, in an early condition of wear; from the Pliocene of the Siwalik Hills, India. This specimen is described by Falconer and Cautley in the 'Journal of the Asiatic Society of Bengal,' vol. vi. p. 354, and is figured in 'Falconer's Palæontological Memoirs,' vol. i. pl. xxiv. figs. 5, 6. The teeth correspond

[1] Prodromus Syst. Mamm. et Avium, p. 67 (1811).
[2] Zool. et Pal. Françaises, 1st ed. p. 5 (1848–52).
[3] Ostéographie, Genus *Pithecus*, p. 57 (1841).
[4] *Loc. cit.* [5] *Loc. cit.*
[6] Hist. Nat. d. Mammifères (1821) (*Semno-pithèque*).
[7] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. iii. p. 123 (1884).

precisely in size and form[1] with those of *Semnopithecus entellus*, but the depth of the ramus is considerably less. The resemblance is so close that there is every probability that the fossil belongs to the same genus; and as it cannot be identified with any living form, it has received the name of *S. palæindicus*.

Cautley Collection. Presented, 1842.

15711. (*Fig.*) Fragment of the right ramus of the mandible, containing the last true molar, in an unworn condition; from the Pliocene of the Siwalik Hills. This specimen is described by Falconer and Cautley in the memoir cited above, and is represented in figs. 7, 8 of the above-mentioned plate of 'Falconer's Palæontological Memoirs.' It is regarded by its describers as belonging to the same species as the last specimen, with which it agrees in size. There is a slight difference in the form of the talon of the last molar, but it is quite probable that this may be merely an individual variety. *Cautley Collection. Presented*, 1842.

M. 1539. Cast of the right astragalus. The original was obtained from the Pliocene of the Siwalik Hills, and is preserved in the Museum of the Geological Society. It is described and figured by Falconer and Cautley in the Trans. Geol. Soc. ser. 2, vol. v. p. 499; and differs very slightly from the corresponding bone of *Semnopithecus entellus*, whence it is highly probable that it may belong to the same species as the two mandibles noticed above. *Made by permission of the Council of the Geological Society.*

Semnopithecus monspessulanus, P. Gervais[2].

Hab. France.

M. 1893. Five casts of detached teeth. The originals are from the Lower Pliocene of Montpellier (Hérault), France; and are described and figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. p. 19, pl. i. figs. 7–11.

Presented by Sir R. Owen, K.C.B., 1884.

[1] Falconer and Cautley stated that there is a difference in the form of the last molar; but many specimens of *S. entellus* exhibit the same character. In consequence of this supposed difference they were disposed to refer the specimen to *Macacus* (*Pithecus*). It may be observed that a species of that genus allied to *M. rhesus* has been described from the Siwaliks by the present writer (Rec. Geol. Surv. Ind. vol. xi. p. 66, xii. p. 41) under the name of *M. sivalensis*.

[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 6 (1848–52).

Genus **MACACUS**, Cuv. and Geoffroy[1].

Syn. *Inuus*, Geoffroy[2].

Macacus pliocenus, Owen[3].

Hab. England.

M. 1892. (*Fig.*) Fragment of the right maxilla, with the penultimate true molar, in a partially worn condition; from the Pleistocene of Grays, Essex. This specimen is the type of the species, and is figured by Owen in the passage cited. It appears extremely doubtful whether the specimen is sufficient for the determination even of the genus to which it belonged; and it is highly probable that it may be specifically identical with one of the existing African species of *Macacus* or *Cercocebus*[4]. *Presented by Sir R. Owen, K.C.B.*, 1884.

Genus **CYNOCEPHALUS**, Lacépède[5].

Syn. *Papio*, Erxleben[6].

Cynocephalus subhimalayanus, H. v. Meyer[7].

Syn. *Semnopithecus subhimalayanus*, H. v. Meyer[8].

Hab. India.

31157. (*Fig.*) The greater portion of the right maxilla and premaxilla, showing the root of the zygomatic arch and the inferior border of the orbit, and containing the whole of the five teeth of the cheek-series and the broken base of the canine; from the Pliocene of the Siwalik Hills, India. This specimen is described and figured by Baker and Durand in the 'Journal of the Asiatic Society of Bengal,'

[1] Magasin Encyclopédique, 1795 (*teste* Geoffroy), *Macaque*.

[2] Ann. d. Muséum, vol. xix. p. 97 (1812).

[3] British Fossil Mammals and Birds, p. xlvi (1846).

[4] Assuming the correctness of the ordinal determination of this specimen (of which there seems no reasonable doubt), it disproves the statement made by Prof. Boyd Dawkins in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 394 (1880), that "the family of Apes passed away from among the European fauna" with the extinction of *Macacus florentinus* of the Upper Pliocene.

[5] "Nouvelle Table Méthodique" (1799), in Mém. d. l'Institut, vol. iii. p. 490 (1801).

[6] Syst. Reg. Animal, p. 15 (1777).

[7] In Bronn's 'Index Palæontologicus,' p. 1133 (1848), *Semnopithecus*.

[8] *Loc. cit.*

vol. v. p. 739 (1836), but the genus was not determined. It is figured in 'Falconer's Palæontological Memoirs,' vol. i. pl. xxiv. figs. 1, 2; and has been referred by H. von Meyer, in the passage cited, to *Semnopithecus*, with the specific name *subhimalayanus*. This generic reference has been till lately provisionally adopted by the present writer[1].

The small size of the canine shows that the specimen belongs to a female individual, while the horizontal flattening of the infraorbital portion of the maxilla, the nearly horizontal and elongated inferior border of the orbit, the forward position of the cheek-teeth relatively to the orbit, and the general "prognathism," conclusively show that it belongs to a species of *Cynocephalus*[2]. This identification is confirmed by the character of the molars, which are of relatively large size, and have their inner cusps, or columns, expanded antero-posteriorly, so as to partially block the median transverse valleys[3]: in both these respects these teeth differ from the molars of *Semnopithecus*, *Cercopithecus*, *Macacus*, &c. The writer has been unable to compare the specimen with female skulls of all the species of the genus. The general contour is not unlike that of *Cynocephalus babouin*; but the lateral surface of the maxilla is convex instead of concave; and the teeth are of considerably larger size. In respect of the form of the maxilla, the female of *C. anubis* comes nearer to the fossil. The space occupied by the five cheek-teeth is the same as in a full-sized male of *C. porcarius*, but the true molars of the fossil are considerably wider. The males of the fossil species were probably considerably larger than any of the existing species. In the absence of a complete series of female skulls of the various existing species, the affinities of the fossil cannot be further indicated[4].

Presented by Generals Sir W. E. Baker, K.C.B., and Sir H. M. Durand, K.C.B., 1848.

[1] The specimen is referred to *Cynocephalus* in the 'Palæontologia Indica,' ser. 10, vol. iii. p. 123 (1884).

[2] The latter features are shown in the figures; the perforation in the lateral wall of the maxilla is accidental.

[3] Well shown in the figures.

[4] It may be observed that the maxilla of a large Siwalik ape has been described and figured by the writer (Rec. Geol. Surv. Ind. vol. xii. p. 33) under the name of *Palæopithecus sivalensis*; the molars of this species are, however, like those of the living Anthropoid apes.

Cynocephalus, sp.

Hab. India.

15709. (*Fig.*) The greater portion of the mandible of a species of the present genus, showing the three true molars of the right side (in a much-worn condition), the broken bases of some of the premolars and two incisors. This specimen is described by Falconer and Cautley in the 'Journal of the Asiatic Society of Bengal,' vol. vi. p. 354 (1837), and is figured in 'Falconer's Palæontological Memoirs,' vol. i. pl. xxiv. figs. 3, 4. It was originally compared with the mandible of *Semnopithecus entellus*, and shown to be of much larger size, with a relatively narrower symphysis, and was considered too small to belong to the same species as the large maxilla described above.

In general form the specimen corresponds so closely with the mandible of *Cynocephalus* that it may be safely referred to that genus. The canine is unfortunately wanting, but the protuberance of the jaw at the point where this tooth should be, the form of $\overline{\text{pm. 3}}$, and the generally elongated form of the jaw, seem to indicate that the specimen probably belonged to a male. The length of the three true molars is the same as in a female jaw of *C. babouin*; and the form of the teeth is precisely the same in the two, the last molar having a very short talon. The teeth are considerably smaller than those of a male *C. porcarius*, in which the talon of $\overline{\text{m. 3}}$ is much longer. The size of the present specimen indicates that it probably belongs to a second Siwalik species of *Cynocephalus*, smaller than *C. subhimalayanus*. The occurrence of this African genus in the Siwaliks of India is a well-marked instance of the former unity of the faunas of these two countries. *Cautley Collection. Presented*, 1842.

Genus *non det.*

Hab. India.

17135. The premaxillæ of a species of Monkey, containing the incisors, in a much-worn condition; from the Pliocene of the Siwalik Hills, India. In size this specimen agrees nearly with *Semnopithecus entellus*; but the inferior border of the nasal aperture is much wider than in that genus or *Macacus*, being more like that of some of the higher Primates. The specimen is apparently too small for *Palæopithecus* or *Cynocephalus*. *Cautley Collection. Presented*, 1842.

Genus **MESOPITHECUS**, Wagner[1].

Mesopithecus pentelici, Wagner[2].

Syn. *Mesopithecus major*, Roth and Wagner[3].
Semnopithecus pentelici, Gaudry and Lartet[4].

Hab. S. Europe.

49671. Cast of the cranium, much crushed and wanting the premaxillæ. The original is from the Lower Pliocene of Pikermi, Attica, and is preserved in the Museum at Munich. It is figured by Wagner in the Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. viii. pl. iii. fig. 2.
Purchased, 1879.

49672. Cast of the cranium of a small individual. The original is from the Lower Pliocene of Pikermi, and is preserved in the Museum at Munich. It is figured by Wagner (*op. cit.* fig. 1). *Purchased*, 1879.

49672 a. Cast of the mandible of an adolescent individual. The original is from the Lower Pliocene of Pikermi, and is preserved in the Museum at Munich. *Purchased*, 1879.

49719. Fragment of the premaxillæ and the right maxilla, showing the anterior teeth, and another of the left ramus of the mandible, showing the last two molars, in a well-worn condition; from the Lower Pliocene of Pikermi.
Purchased, 1879.

Family CEBIDÆ.

Dentition:—I. $\frac{2}{2}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$.

Genus **CEBUS**, Erxleben[5].

Cebus apella (Linn.[6]).

Syn. *Simia apella*, Linn.
Cebus macrocephalus, Spix (*teste* Gray).
? *Cebus macrognathus*, Lund.

Hab. Brazil.

[1] Gelehrte Anzeigen, vol. viii. no. 38, p. 310 (1839).
[2] *Loc. cit.* The name was originally given *pentelicus*, but was amended by Gaudry.
[3] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. vii. pl. i. (1854).
[4] Comptes Rendus, vol. xliii. (1856).
[5] Syst. Reg. An. p. 44 (1777). [6] Syst. Nat. ed. 12, vol. i. p. 42 (1776).

18870. The greater portion of the left ramus of the mandible, showing the first and second true molars and the alveoli of the other cheek-teeth; from a cavern in Minas Geraes, Brazil. This specimen agrees exactly with the mandible of the form known as *C. macrocephalus*, which is included by Gray in *C. apella*. This species is not mentioned by H. Gervais and Ameghino in 'Les Mammifères Fossiles de l'Amérique de Sud' (Paris, 1880); but it is not improbable that the so-called *C. macrognathus*, Lund (G. & A. *op. cit.* p. 7), is really the same.

Claussen Collection. Purchased, 1845–8.

Genus **MYCETES**, Illiger[1].

Dentition.—The crowns of the molars have a structure not unlike those of certain Selenodont Artiodactyla like *Anthracotherium*; a similar structure prevailing in many Lemuroids.

Mycetes ursinus (Geoffroy[2]).

Syn. *Stentor ursinus*, Geoff.[3]

Hab. Brazil.

18866. The cranium (wanting the zygomatic arches and some of the anterior teeth) and the greater part of the mandible; from a cavern in Minas Geraes, Brazil. No species of this genus is mentioned from the Brazilian caverns by Gervais and Ameghino (*op. cit.*).

Claussen Collection. Purchased, 1845–8.

Suborder *LEMUROIDEA*.

Family LEMURIDÆ.

Subfamily ADAPISINÆ.

Genus **ADAPIS**, Cuvier[4].

Syn. *Aphelotherium* Gervais[5].
(?) *Cœnopithecus*, Rütimeyer[6].
Palæolemur, Delfortrie[7].

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[1] Prodromus Syst. Mam. et Av. p. 70 (1811).
[2] Ann. d. Muséum, vol. xix. p. 108 (1812).
[3] *Loc. cit.*
[4] Ossemens Fossiles, 2nd ed. vol. iii. p. 265 (1822).
[5] Zool. et Pal. Françaises, 1st ed. vol. ii., Explanation no. 34 (1848–52).
[6] Denkschr. schw. nat. Ges. vol. xix. art. 3, p. 88 (1862).
[7] Comptes Rendus, vol. lxxvii. p. 64 (1873).

Dentition:—I. $\frac{2}{2}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

This and the next genus are referred by Filhol, in the Ann. Sci. Géol. vol. v. art. 4, pp. 1–36 (1874), to a separate group, under the name of "Pachylémuriens." *Adapis* is referred, however, by Flower to the family *Lemuridæ* and the subfamily *Lorisinæ*. It is, however, distinguished from the latter by the presence of an additional premolar. The two fossil genera are here provisionally referred to a distinct subfamily.

Adapis parisiensis, Cuvier[1].

Syn. *Aphelotherium duvernoyi*, Gervais[2].
Palæolemur betillei, Delfortrie[3].
Adapis duvernoyi, Gaudry[4].

Hab. S. Europe.

M. 1345. The nearly complete cranium, wanting the premaxillæ and nasals, and pm. 1 of either side; from the Upper Eocene of Caylux (Tarn-et-Garonne), France.
Purchased, 1884.

44892. Cast of the cranium. The original is from the Upper Eocene of Beduer (Lot), France; and is described and figured by Delfortrie in the Act. Soc. Linn. Bordeaux, vol. xxix. pt. 1, pl. v. (1873).
Presented by M. Delfortrie, 1874.

M. 1633. Cranium, with the hinder portion of the right ramus of the mandible attached; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen, although somewhat obscured by matrix, is valuable, as it shows the enormously developed coronoid process of the mandible, as in the perfect specimen figured by Filhol in the Ann. Sci. Géol. vol. xiv. pl. x. fig. 4. *Purchased*, 1884.

M. 1634. The mandible, imperfect posteriorly, and wanting the incisors, canines, and first premolars; from the Upper Eocene of Bach. This specimen is precisely similar to one figured by Filhol in the Ann. Sci. Géol. vol. viii. pl. v. fig. 229. *Purchased*, 1884.

[1] Ossemens Fossiles, 2nd ed. vol. iii. p. 265 (1822).
[2] *Loc. cit.* (1848–52). [3] *Loc. cit.* (1873).
[4] Les Enchaînements, Mam. Tert. p. 224 (1878). Gaudry identifies *A. parisiensis* with *A. magna*, Filhol; but Filhol (Ann. Sci. Géol. vol. xiv. art. 5) does not accept this. Cope was inclined to identify *Notharctus*, Leidy, with *Adapis*; but this is not accepted by Filhol.

M. 1721. Five imperfect rami of the mandible; from the Upper Eocene of Bach. *Purchased*, 1884.

Var. *crassus*, Filhol[1].

M. 1721 a. Portion of the right ramus of the mandible; from the Upper Eocene of Bach. This specimen agrees very closely with the specimen figured by Filhol in the Ann. Sci. Géol. vol. xiv. pl. xi. figs. 11, 12. *Purchased*, 1884.

Genus **NECROLEMUR**, Filhol[2].

Dentition:—I. $\frac{2}{2}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$.

Necrolemur antiquus, Filhol[3].

Hab. France.

M. 1647. Fragment of the left ramus of the mandible, containing the three true molars, the third and fourth premolars, and the alveolus of $\overline{\text{pm. 2}}$; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen appears to agree precisely with the mandible of the specimen figured by Filhol in the Ann. Sci. Géol. vol. viii. pl. iv. fig. 213. *Purchased*, 1884.

M. 1648. Fragments of the mandible; from the Upper Eocene of Bach. *Purchased*, 1884.

Necrolemur edwardsi, Filhol[4].

Hab. France.

M. 1649. Fragment of the left ramus of the mandible, containing the first and second true molars; from the Upper Eocene of Bach. This specimen agrees exactly with the mandible figured by Filhol in the Ann. Sci. Géol. vol. xiv. pl. xi. fig. 4. *Purchased*, 1884.

[1] Ann. Sci. Géol. vol. xiv. art. 5, p. 34 (1883).

[2] Comptes Rendus, vol. lxxvii. p. 1112 (1873). Cope considered this genus the same as *Anaptomorphus*; but this is denied by Filhol (Ann. Sci. Géol. vol. xiv. art. 5, p. 3).

[3] *Loc. cit.*

[4] Comptes Rendus, vol. xc. p. 1580 (1880).

Order CHIROPTERA.

Suborder *MICROCHIROPTERA.*

Family RHINOLOPHIDÆ.

Genus **RHINOLOPHUS,** Geoffroy[1].

Dentition:—I. $\frac{1}{2}$, C. $\frac{1}{1}$, Pm. $\frac{2}{3}$, M. $\frac{3}{3}$.

Rhinolophus ferrum-equinum (Schreb.[2]).

Syn. *Vespertilio ferrum-equinum*, Schreb.[3]

Hab. Europe, Asia, and Africa.

15082–92. Fragments of the cranium and mandible; from Kent's-Hole Cavern, Torquay. These specimens are mentioned by Owen in the 'History of British Fossil Mammals and Birds,' p. 16. *McEnery Collection. Purchased*, 1842.

Rhinolophus antiquus, Filhol[4].

Hab. France.

M. 1346. Palatal portion of the cranium, showing the cheek-dentition of both sides; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. A figure of the upper dentition is given by Filhol in the Ann. Sci. Géol. vol. vii. pl. xi. fig. 2; but in that specimen the minute pm. 3 is not shown. This tooth is present in the British-Museum specimen, and is wedged in between the canine and pm. 4, which are almost in contact. In this respect, therefore, the species agrees with the *R. ferrum-equinum* section of the genus[5]; but it will be shown to differ in the dentition of the lower jaw. *Purchased*, 1884.

M. 1640. Cranium, with the mandible attached; from the Upper Eocene of Caylux. This specimen is much obscured by matrix; and the minute pm. 3 is not visible.
Purchased, 1884.

[1] Desm. Nouv. Dict. d'Hist. Nat. vol. xix. p. 383 (1803).
[2] Säugeth. vol. i. p. 174 (1775), *Vespertilio.*
[3] *Loc. cit.*
[4] Comptes Rendus, vol. lxv. p. 94 (1872).
[5] *Vide* Dobson, 'Catalogue of Chiroptera in the British Museum,' pp. 101, 104 (1878).

M. 1637. Three specimens of the right maxilla; from the Upper Eocene of Caylux. The two complete specimens show the minute pm. 3. *Purchased*, 1884.

M. 1638. Two specimens of the maxilla; from the Upper Eocene of Caylux. These specimens are rather smaller than any of the others; but as the dentition is precisely similar, it is not improbable that the difference in size is merely an individual or sexual character. *Purchased*, 1884.

M. 1639. The hinder portion of the cranium; from the Upper Eocene of Caylux. This specimen agrees precisely with the smaller crania figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. x. *Purchased*, 1884.

M. 1635. Two specimens of the right ramus of the mandible; from the Upper Eocene of Caylux. One specimen shows the three true molars, the alveoli of three premolars, the alveolus of the canine, and the two incisive alveoli. The other specimen shows the three true molars and the three premolars. The penultimate premolar is in contact with the two teeth on either side, and is placed in the tooth-row. In this respect the species differs from the *R. ferrum-equinum* section, and agrees with the *R. cœlophyllus* section[1]; which is precisely contrary to the condition prevailing in the upper dentition. This is one more of the many instances where the fossil forms do not agree with the subdivisions in which the recent forms are arranged. These specimens agree precisely with an enlarged figure of the mandible, in which the anterior teeth are wanting, given by Filhol in the Ann. Sci. Géol. vol. vii. pl. xi. fig. 4. *Purchased*, 1884.

M. 1636. Eleven specimens of the mandible, more or less complete; from the Upper Eocene of Caylux. *Purchased*, 1884.

Genus **PHYLLORHINA**, Leach[2].

Dentition:—I. $\frac{1}{2}$, C. $\frac{1}{1}$, Pm. $\frac{(1—2)}{2}$, M. $\frac{3}{3}$.

The genus is confined at the present day to the tropical regions of the Old World and Australia.

[1] *Vide* Dobson, *op. cit.*

[2] Syst. Cat. Indig. Mamm. and Birds Brit. Mus. p. 5 (1816).

Phyllorhina (?), sp.

Hab. France.

M. 1641. Cranium, with the mandible attached, and two specimens of the left ramus of the mandible; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. The dentition is that of *Phyllorhina* (there being only two premolars in the mandible); and the specimens are practically indistinguishable from the skull of the existing Australian *Phyllorhina cervina*; and it is therefore most probable that they belong to the same genus. The occurrence of that genus in the Lower Tertiaries of Europe is quite what might have been expected. It may be added that *Palæonycteris robustus*, from the Lower Miocene of St. Gérand-le-Puy[1], and *Vespertilio murinoides*[2], from Sansan, are distinguished by the presence of three lower premolars.

Purchased, 1884.

M. 1642. Numerous rami of the mandible; from the Upper Eocene of Caylux. *Purchased*, 1884.

Family VESPERTILIONIDÆ.

Genus **VESPERTILIO**, Linn.[3]

Dentition:—I. $\frac{2}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{3}{3}$.

It is probable that for palæontological purposes this generic term must be employed in a wider sense than in recent zoology, although it may be restricted to forms having the above-mentioned dental formula[4].

[1] *Vide* Filhol, Ann. Sci. Géol. vol. x. art. 3, p. 4, pl. i. (1879).

[2] *Vide infrà.*

[3] Syst. Nat. ed. 12, vol. i. p. 46 (1766).

[4] In the so-called *Vespertilio bourguignati*, Filhol (Ann. Sci. Géol. vol. vii. art. 7, p. 45, pl. xi. figs. 5, 8 [1876]), the second and third upper premolars are well developed, and the third is larger than the second; in the mandible the third premolar is minute. This species does not therefore agree with *Vespertilio*, as defined by Dobson (*op. cit.* p. 284), in which the second and third upper premolars (first and second of Dobson) are very small, and the third always smaller than the second; the lower dentition is not dissimilar. In respect of the upper premolars the fossil agrees with the South-American genera *Natalus* and *Thyroptera* (Dobson, *op. cit.* pp. 341, 345); but in those genera $\overline{\text{pm. 3}}$ is a large tooth.

Vespertilio murinoides, Lartet[1].

Hab. France.

33265. Fragment of the left ramus of the mandible, containing the last premolar and the first and second true molars, as well as the alveoli of $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$ and of the canines; from the Middle Miocene of Sansan (Gers), France. This specimen seems to agree with the enlarged figures given by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xliv. figs. 5–7. Judging from the size of its alveolus, it appears that $\overline{\text{pm. 3}}$ was relatively large; and it is therefore doubtful whether the species belongs to the genus in the sense in which it is employed in recent zoology.

Presented by M. Ed. Lartet, 1858.

33265 a. Distal half of the femur; from the Miocene of Sansan.

Presented by M. Ed. Lartet, 1858.

Vespertilio insignis, H. von Meyer[2].

Hab. Europe.

25452. The greater part of the humerus; from the Lower Miocene of Mayence. The specific distinctness of this form is very doubtful, as it was mainly named from the humerus; there is equal doubt as to the correctness of the generic determination. *Purchased*, 1850.

Order INSECTIVORA.

It has been deemed advisable to follow the arrangement adopted in the Zoological Department of the Museum, and to place this order and the Chiroptera between the Primates and the Carnivora. The writer would, however, have preferred placing the present order after the Carnivora, in proximity to the Carnivora Primigenia, which would then have been placed after the existing Carnivora. As will be noticed below, it is highly probable that the present order should be regarded as a suborder of Carnivora.

[1] Notice sur la Colline de Sansan, p. 12 (1851).

[2] Neues Jahrb. 1845, p. 798.

Suborder *INSECTIVORA VERA.*

Family TALPIDÆ.

Subfamily TALPINÆ.

Genus **TALPA,** Linn.[1]

(Including *Geotrypus* and *Hyporyssus*, Pomel.[2])

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

Talpa europæa, Linn.[3]

Hab. Europe.

17645–52. Fragments of the mandible, and several bones of the axial and appendicular skeleton; from the Forest-bed of Ostend, near Bacton, Norfolk. *Green Collection. Purchased*, 1843.

Talpa telluris (Pomel[4]).

Syn. *Hyporyssus telluris*, Pomel[5].
Talpa sansaniensis, Lartet[6].

Hab. France.

21849. The greater portion of the humerus; from the Middle Miocene of Sansan. This specimen agrees with the one from the same locality figured by De Blainville ('Ostéographie,' Insectivores, pl. xi.), which is referred by P. Gervais to *T. telluris*. *Croizet Collection. Purchased*, 1848–9.

Talpa, sp. non. det.

Hab. Europe.

48196. Two humeri; from the Middle Miocene of Steinheim, Bavaria. *Purchased*, 1877.

21849 a. Humerus; from the Lower Miocene of Allier, France. *Croizet Collection. Purchased*, 1848–9.

M. 413. Several specimens of the humerus; from the Upper Eocene of Caylux, France. These bones are more elongated than in typical forms. *Purchased*, 1884.

[1] Syst. Nat. ed. 12, vol. i. p. 73 (1766).
[2] Arch. Sci. Phys. Nat. vol. ix. pp. 159–161 (1848).
[3] *Loc. cit.* [4] *Op. cit.* p. 161.
[5] *Ibid.* [6] Notice sur la Colline de Sansan, p. 14 (1851).

Subfamily MYOGALINÆ.

Genus **MYOGALE,** Cuvier[1].

Syn. *Palæospalax,* Owen[2].
Desman, Lacépède.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

Myogale moschata (Linn.[3]).

Syn. *Castor moschatus,* Linn.[4]
Mygale muscovitica, Geoffroy.
Palæospalax magnus, Owen[5].
Talpa magna, Pomel[6].

Hab. Europe.

16120. (*Fig.*) Portion of the left ramus of the mandible, containing the three true molars and the last three premolars; from the Forest-bed of Ostend, near Bacton, Norfolk. This specimen is described and figured by Owen in the 'British Fossil Mammalia and Birds,' pp. 25, 26, figs. 12, 13, under the name of *Palæospalax magnus,* of which it is the type. For the authority for the present generic reference, see Newton, Geol. Mag. dec. 2, vol. viii. p. 256 (1881).
Green Collection. Purchased, 1843.

Family SORICIDÆ.

Genus **SOREX,** Linn.[7]

Dentition:—I. $\frac{\text{var.}}{1}$, C. $\frac{1}{1}$, Pm. $\frac{\text{var.}}{1}$, M. $\frac{3}{3}$.

Sorex (?), sp. non det.

28079. Fragments of the mandible; from the Pleistocene of Grays, Essex. *Presented by J. Broun, Esq.,* 1852.

31059–60. Fragments of the mandible and humerus; from the Lower Miocene of Allier, France.
Bravard Collection. Purchased, 1852.

[1] Tab. de Classification, appended to 'Leçons d'Anat. Comp.' vol. i. (1800) (*Mygale*).
[2] Brit. Foss. Mamm. and Birds, p. 25 (1846).
[3] Syst. Nat. ed. 12, vol. i. p. 79 (1766), *Castor.*
[4] *Loc. cit.* [5] *Op. cit.*
[6] Arch. Sci. Phys. Nat. vol. ix. p. 160 (1848).
[7] Syst. Nat. ed. 12, vol. i. p. 73 (1766).

Genus **CROSSOPUS,** Wagler[1].

Dentition.—Teeth nearly the same in number as in *Sorex*, but different in colour.

Crossopus fodiens (Pallas[2]).

Syn. *Sorex fodiens,* Pallas.

Hab. Europe.

15949, 17653 a. (*Fig.*) Three portions of the mandible; from the Forest-bed of Ostend, near Bacton, Norfolk. One of these specimens is figured in Owen's 'British Fossil Mammals and Birds,' p. 28, fig. 14. *Green Collection. Purchased,* 1843.

Crossopus remifer (Geoffroy[3]).

Syn. *Sorex remifer,* Geoffr.[4]

Hab. Europe.

15949 a, 17653. (*Fig.*) Two rami of the mandible; from the Forest-bed of Ostend, near Bacton, Norfolk. One of these specimens is figured by Owen in the figure cited. Newton (Geol. Mag. dec. 2, vol. viii. p. 259) expresses some doubt as to the correctness of the specific determination of the present specimens, as well as those referred to the preceding species. *Green Collection. Purchased,* 1843.

Family ERINACEIDÆ.

Genus **ERINACEUS,** Linn.[5]

Dentition:—I. $\frac{3}{2}$, C. $\frac{1}{1}$, Pm. $\frac{3}{2}$, M. $\frac{3}{3}$.

Erinaceus arvernensis, P. Gervais[6] (*non* Blainv.).

Hab. Europe.

History.—The name *E. arvernensis* was assigned by De Blainville ('Ostéographie,' Insectivores, p. 102, pl. xi.) to certain remains from France, which were said by Croizet to exhibit affinities with *Tupaia.* Subsequently Gervais, in the passage cited, figured certain remains from Auvergne (noticed below) under the same name. Still later

[1] Isis, 1832, p. 275.
[2] In Schreber's 'Säugethiere,' vol. iii. p. 571 (1778), *Sorex.*
[3] Ann. d. Mus. vol. xvii. p. 182 (1811), *Sorex.* [4] *Loc. cit.*
[5] Syst. Nat. ed. 12, vol. i. p. 75 (1766).
[6] Zool. et Pal. Françaises, 2nd ed. p. 53, figs. 10, 11 (1859).

Fraas ('Fauna von Steinheim,' p. 4) referred Blainville's specimens to another genus, under the name of *Parasorex socialis*. It appears, from a comparison of Gervais's specimens with De Blainville's figures, that the two belong to different genera, the former being really an *Erinaceus*. Under these circumstances it appears, on the whole, advisable to apply the name *arvernensis* to the *Erinaceus*, and to take another specific name for De Blainville's specimens, which are referred below to *Plesiosorex*.

27825. The nearly complete left ramus of the mandible, showing (*Fig.*) all the teeth; from the Lower Miocene of Cournon (Puy-de-Dôme), France. This specimen is the type, and shows all the teeth, which agree precisely with those of *Erinaceus*, especially in the small size of the last true molar and of the three teeth in front of $\overline{\text{pm. 4}}$; it is figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. p. 53, fig. 11. In size and form it is very like the mandible of some of the smaller Asiatic species [1].

Croizet Collection. Purchased, 1848.

27825 a. Part of the left ramus of the mandible, containing the last premolar and the first true molar; from Lower Miocene of Cournon. This specimen is figured by Gervais, *op. cit.* figs. 10, 10 *a*. *Croizet Collection. Purchased*, 1848.

27825 b. Part of the left ramus of the mandible, containing the broken bases of $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$; from the the Lower Miocene of Cournon. *Croizet Collection. Purchased*, 1848.

27825 d. Fragment of the right ramus of the mandible, containing the inner incisor and the last premolar; from the Lower Miocene of Cournon.

Croizet Collection. Purchased, 1848.

27825 c. Part of the left ramus of the mandible, containing the inner incisor, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$; from the Lower Miocene of Cournon. *Croizet Collection. Purchased*, 1848.

27814. Fragment of the right ramus of a mandible, without teeth, which may belong to the present species; from the Lower Miocene of Sauvetat (Puy-de-Dôme), France.

Croizet Collection. Purchased, 1848.

[1] E. g. *E. micropus*, Blyth. *Vide* Journ. As. Soc. Beng. vol. xlvii. pt. 2, pl. Va (1878).

GENUS *non det.*

M. 1492. Two fragments of the symphysial extremity of the right ramus of the mandible, and a fragment of the maxilla, of an Insectivore apparently allied to *Erinaceus*; from the Upper Eocene of Caylux, France. The specimens are too imperfect to admit of certain determination.

Purchased, 1884.

Family TUPAIIDÆ.

Genus **PLESIOSOREX**, Pomel[1].

Syn. *Parasorex*, H. von Meyer[2].

Dentition:—I. $\frac{?}{?}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

Plesiosorex soricinoides (Blainville[3]).

Syn. *Erinaceus soricinoides*, Blainville[4].
Erinaceus arvernensis, Blainville[5] (*non* Gervais).
Plesiosorex talpoides, Pomel[6].
Parasorex socialis, H. von Meyer[7].

Hab. Europe.

48197. Two fragments of the mandible; from the Middle Miocene of Steinheim, Bavaria. A perfect cranium and mandible are figured by O. Fraas, in the 'Fauna von Steinheim,' pl. i. figs. 2–5, under the name of *Parasorex socialis*. The species differs from the genus *Tupaia* by the presence of an additional premolar in both jaws, but is otherwise closely allied, and it is not improbable that it should really be referred to the same genus. *Purchased*, 1877.

[1] Arch. Sci. Phys. Nat. vol. ix. p. 162 (1848).
[2] Neues Jahrb. 1865, p. 844.
[3] 'Ostéographie,' *Insectivores*, p. 100, pl. xi. (1842?), *Erinaceus*.
[4] *Loc. cit.*
[5] *Loc. cit.* p. 102.
[6] Arch. Sci. Phys. Nat. vol. ix. p. 162 (1848).
[7] Neues Jahrb. 1865, p. 844.

Order CARNIVORA.

Suborder *CARNIVORA PRIMIGENIA.*

The present suborder includes the genera *Hyænodon*, *Pterodon*, *Oxyæna*, and probably *Proviverra* (*Cynhyænodon*, Filhol), together with numerous other forms from the older Tertiaries of North America and Europe. In his latest memoir on these animals, Cope[1] includes the whole of them, together with the existing Insectivora, in the suborder Creodonta of his order Bunotheria[2], the latter being a group of primitive mammals comprehending a number of types, and being somewhat analogous to the subclass Metatheria (Marsupialia). By Huxley[3] it is considered probable that *Hyænodon* and its allies occupy a position connecting the Carnivora with the Insectivora; and as *Proviverra* seems to connect them very closely with some of the canoid Carnivora Vera, they are provisionally placed in the former order, with the title of Carnivora Primigenia[4]. It is highly probable that the so-called Insectivora should really form another suborder (Carnivora Insectivora) of the Carnivora; but as it seems best, as far as possible, to avoid interfering with the arrangement adopted in recent Zoology, the order has been retained for the present. One of the most distinctive points of the present suborder is the small size of the brain, which in *Proviverra* is more like that of an Insectivore than a Carnivore; while another is the structure of the last three cheek-teeth, all of which assume a sectorial character.

Family HYÆNODONTIDÆ.

Cope[5] includes in this family only the single genus *Hyænodon*, referring the genera *Oxyæna*, *Pterodon*, and others to the family *Oxyænidæ*[6]; the relations between *Hyænodon* and *Pterodon* seem, however, to be so intimate that it appears more advisable to include them in a single family.

[1] Amer. Nat. 1884, pp. 255, 344, 478.

[2] In a former work (Rep. U.S. Geog. Surv. West of 100th Meridian, vol. iv. pt. ii. p. 89) *Hyænodon*, on account of its larger brain, was separated from the Creodonta and referred to the Carnivora.

[3] Proc. Zool. Soc. 1880, p. 284.

[4] The term "Creodonta" would be inappropriate if applied in this conjunction.

[5] Amer. Nat. 1884, p. 261.

[6] *Ibid.* p. 480.

Genus **HYÆNODON,** Laizer and Parieu[1].

Syn. *Taxotherium,* Blainville[2] (*teste* P. Gervais).
Eutemnodus, Bravard, MS.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$. Cope[3] gives the number of cheek-teeth as Pm. $\frac{3}{4}$, M. $\frac{3}{3}$, reckoning the fourth upper tooth as a molar instead of a premolar. If, however, the crania of *Hyænodon* and *Pterodon*, figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pls. i. & ii., be compared together, it will be pretty evident that the fourth cheek-tooth in the two specimens is homologous; and it is quite clear that this tooth is a premolar in *Pterodon*. Filhol, in the Ann. Sci. Géol. vol. vii. art. 7, p. 211, remarks that *Hyænodon vulpinus* differs from all the other species by the presence of six in place of seven upper cheek-teeth; but the present writer has never seen any instance of the presence of m. 3 in any species, and it is certainly wanting in all the specimens figured by Filhol.

The genus is abundantly distributed in the Lower Tertiaries of Europe and North America, and one species (or a closely allied form) has been described from the Siwaliks of India (*vide infrà*).

Hyænodon heberti, Filhol[4].

This is the largest European species of the genus. It has not hitherto been recorded from Vaucluse.

Hab. France.

26749. The greater part of the right ramus of the mandible[5], containing the whole of the cheek-dentition and the canine; from the Upper Eocene of Débruge, near Apt (Vaucluse),

[1] Comptes Rendus, vol. vii. p. 442 (1838).

[2] 'Ostéographie,' Genus *Subursus*, p. 55 (1841). *Taxotherium* is identified with *Hyænodon* on the authority of P. Gervais (Zool. et Pal. Franç. 2nd edit. pp. 232–235); but it is very doubtful what *Taxotherium* (*Hyænodon*) *parisiense* really is. Gervais refers Pomel's *Pterodon cuvieri* to it; but that species seems to be the same as *Pterodon dasyuroides*.

[3] Amer. Nat. 1884, p. 345.

[4] Bull. Soc. Philom. Paris, ser. 6, vol. xi. pp. 16–21 (1874).

[5] This and other specimens from Vaucluse have been hitherto labelled *H. requieni*; but they are of much larger size, as will be shown below. Some (*e. g.* No. 28203) are entered in Bravard's MS. Catalogue as *Eutemnodus eurhynchus*, Bravard. The same generic term has been employed by Bravard (*vide* H. Gervais and Ameghino, 'Les Mammifères fossiles de l'Amérique du Sud,' p. 21 [1880]) for a fossil Carnivore from the Pleistocene of S. America, which cannot now be identified. It would be very remarkable if *Hyænodon* were found in those deposits.

France. This specimen agrees precisely with the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxii. fig. 160. The following are the dimensions of the type and the present specimen, viz.:—

	Type.	No. 26749.
Length of pm. 3	0,017	0,016
„ „ pm. 4	0,0175	0,0161
„ m. 1	0,009	0,010
„ „ m. 2	0,014	0,0141
„ „ m. 3	0,021	0,023
Space occupied by last five teeth	0,080	0,079
Interval between canine and hinder border of m. 3	....	0,107
Depth of jaw at m. 1	0,043	0,040

The present specimen shows the first and second premolars, which are wanting in the type; the crown of the first premolar is very low, while that of the second is not very high and is elongated antero-posteriorly. The canine, of which the summit is broken off, is relatively short and thick. There is but one mental foramen.

Bravard Collection. Purchased, 1852.

28203. The cranium and mandible in a much-crushed condition; from the Upper Eocene of Débruge. This specimen is important, as showing the association of the cranium and mandible, although all the mandibular teeth are wanting, except the canine and $\overline{\text{pm. 2}}$; the form of the mandible agrees precisely with that of the last specimen. The last upper premolar has a small anterior talon. The interval between the canine and the hinder border of the last true molar is 0,090, and the antero-posterior diameter of the canine is 0,017. This specimen is the type of Bravard's *Eutemnodus*. *Bravard Collection. Purchased*, 1852.

28172. The mandible, wanting the symphysis, and showing all the cheek-teeth except $\overline{\text{pm. 1}}$; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

26756. The greater portion of the left ramus of the mandible, with the teeth much worn; from the Upper Eocene of Vaucluse. *Pomel Collection. Purchased*, 1851.

M. 1673. The hinder portion of the cranium of a *Hyænodon*, which, from its large size, may probably be referred to the pre-

sent species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. *Purchased*, 1884.

M. 1674. Part of the left ramus of the mandible, containing the second and third true molars; from the Upper Eocene of Caylux. This specimen seems to be precisely similar to the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxii. fig. 160. *Purchased*, 1884.

M. 1675. Three canines, not improbably belonging to this species; from the Upper Eocene of Bach, near Lalbenque (Lot), France. *Purchased*, 1884.

28181. The left ramus of the mandible, with the teeth in a broken and much-worn condition; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

27180–6. Several incisor and premolar teeth; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

28204. Fragment of the left ramus of the mandible, containing five cheek-teeth; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

28178–9. Two canines; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

28206–9. Four canines; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

28222. A canine; from the Upper Eocene of Débruge. *Bravard Collection. Purchased*, 1852.

28174. The second left upper true molar, of unusually large size and in an unworn condition; from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

28205, 28227. A premolar and an upper true molar; from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

Hyænodon brachyrhynchus, Blainville[1].

Syn. *Pterodon brachyrhynchus*, Pomel[2].
Pterodon requieni, P. Gervais[3].
Hyænodon requieni, P. Gervais[4].

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[1] 'Ostéographie,' Genus *Canis*, p. 113 (1842?).
[2] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 392 (1846).
[3] Comptes Rendus, vol. xxii. p. 846 (1846).
[4] Zool. et Pal. Françaises, 1st ed. vol. i. p. 129 (1848–52).

This species has been identified by Filhol, in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 12, with *Hyœnodon requieni*. The name *H. brachyrhynchus* apparently has the priority[1]. This species is of considerably smaller size than the last, and is readily distinguished by the crown of the second lower premolar being extremely tall and narrow. The last upper premolar has no distinct anterior talon, and the crown of the second upper premolar is very tall and narrow; the first premolar is small.

Hab. France.

M. 1668. Anterior portion of the cranium and mandible of an immature individual; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen is very important and valuable, as it shows the cranium and mandible in association, which is a comparatively rare condition. It exhibits the upper incisors, the upper and lower canines, most of the upper premolars, m. 3, and the second and third lower premolars—the latter not fully protruded. In the long and narrow pm. 2, and the absence of a distinct anterior talon to pm. 4, this specimen agrees with the cranium figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. i. It also agrees precisely in every detail of shape and size with a more perfect cranium figured by the same writer in a memoir not yet published. The specimen shows that pm. 2 was a tall narrow tooth, very different from that of *H. heberti* (No. 26749). The interval between the canine and m. 1 is 0,041, as compared with 0,051 in *H. heberti* (No. 28203). *Purchased*, 1884.

M. 1351. Fragment of the middle portion of the cranium, comprising part of the palate, the frontals, and nasals, and showing the last three premolars and the two true molars; from the Upper Eocene of Caylux, France. This specimen belonged to an immature individual; but, except in being slightly smaller, it agrees precisely with the cranium figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. i. There is no anterior talon to pm. 4. *Purchased*, 1884.

M. 1363. Fragment of the right maxilla, containing the last two molars; from the Upper Eocene of Caylux. This spe-

[1] In the notice by Filhol, already cited, the impression is given that the specific name *brachyrhynchus* was applied in the original notice by Dujardin (Comptes Rendus, vol. x. p. 134 [1840]); but this is not really the case.

cimen agrees exactly with the corresponding portion of the last specimen. *Purchased*, 1884.

M. 1669. Fragment of the right ramus of the mandible, containing the three true molars, the last two premolars, and the alveolus of the canine; from the Upper Eocene of Caylux. This specimen appears to agree very closely with the mandible figured by P. Gervais in the 'Zoologie et Paléontologie Françaises,' 2nd ed. pl. xxiv. fig. 11. The space occupied by the last five cheek-teeth is 0,057, and the interval between the alveolus of the canine and the hinder border of m. 3 is 0,070. *Purchased*, 1884.

Hyænodon minor, P. Gervais[1].

This species is larger than *Hyænodon brachyrhynchus*, from which it is distinguished by its relatively longer mandible, larger canine, and smaller last lower true molar. The type specimen was obtained from the Upper Eocene near Alais (Gard), France.

Hab. Europe.

29752. The mandible of a very aged individual; from the Headon beds (Upper Eocene) of Hordwell, Hampshire. The teeth are very much worn, the crowns of most of the true molars having completely disappeared; the incisors and the first premolar are wanting, and the crown of the left canine is broken off. The specimen seems to agree precisely with the type mandible figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxv. fig. 9. It differs from the mandible of *H. brachyrhynchus* by its more elongated form, and is considerably larger than that of *H. compressus*, Filhol[2], although somewhat similar in form. It is on the evidence of this specimen (which has been already noticed by the present writer in the Geol. Mag. dec. 3, vol. i. p. 444) that the occurrence of *Hyænodon* in the Hampshire basin[3] is recorded in the Quart. Journ. Geol. Soc. vol. xxxix. p. 571. The interval between the canine and the hinder border of $\overline{\text{m. 3}}$ is 0,076.

Hastings Collection. Purchased, 1855.

[1] Zool. et Pal. Françaises, 1st ed. vol. i. p. 129 (1848–52).

[2] Ann. Sci. Géol. vol. vii. pl. xxxiii. figs. 161–163.

[3] The exact position of the bed from which this fossil was obtained is given in the memoir cited. In the Quart. Journ. Geol. Soc. vol. xxxvi. p. 383, Boyd Dawkins mentions the occurrence of *Hyænodon leptorhynchus* in the Headon beds. This statement probably rests on a misidentification of the present specimen.

29814. The last right lower true molar; from the Headon beds of the Isle of Wight. *Hastings Collection.* *Purchased*, 1855.

29807. A canine; from the Headon beds of the Isle of Wight. *Hastings Collection.* *Purchased*, 1855.

Hyænodon leptorhynchus, Laizer and Parieu[1].

Syn. *Pterodon leptorhynchus,* Pomel[2].

In this species the last upper premolar has a well-marked anterior talon, and the second upper premolar has a long and low crown.

Hab. France.

M. 1350. The nearly complete mandible, wanting the incisors and the articular extremity of the left ramus; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This beautiful specimen, in which the teeth are but very slightly worn, agrees very closely with the one figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxv. fig. 10, but is slightly smaller, and the crowns of the two middle premolars appear slightly higher. *Purchased*, 1848.

27821. The imperfect mandible, showing the canine and all the cheek-teeth of the right side except $\overline{\text{m. 3}}$; from the Lower Miocene of Sauvetat (Puy-de-Dôme), France. Slight differences can be detected between the premolars of this and the last specimen. *Croizet Collection.* *Purchased*, 1848.

M. 1379. The last left lower true molar; from the Upper Eocene of Caylux. *Purchased*, 1848.

27793, 27820. A premolar and the last molar of the lower jaw; from the Lower Miocene of Sauvetat. These specimens are provisionally referred to the present species; they are somewhat larger than the corresponding teeth of the foregoing specimen, but they are not larger than those of a specimen figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxix. fig. 143. *Croizet Collection.* *Purchased*, 1848.

M. 1670. Part of the right maxilla, containing the last premolar and the two true molars; from the Upper Eocene of Caylux. This specimen agrees precisely with the corresponding

[1] Ann. Sci. Nat. ser. 2, vol. xi. p. 27 (1839).

[2] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 392 (1846).

portion of the skull figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxix. fig. 143, showing the distinct anterior talon and the low crown of pm. 2, and differing thereby from No. M. 1351 (*H. brachyrhynchus*). It appears that the present specimen cannot, however, be distinguished from the corresponding portion of the skull of *H. aymardi* figured by Filhol in the Ann. Sci. Géol. vol. xii. pl. vii., although that species is distinguished from *H. leptorhynchus* by the presence of a distinct anterior talon to the last lower premolar. *Purchased*, 1884.

M. 1671. Fragment of the left ramus of the mandible, containing the last premolar and the three true molars; from the Upper Eocene of Caylux. This specimen is precisely similar to the corresponding portion of No. M. 1350.
Purchased, 1884.

M. 1672. Fragment of the right ramus of the mandible, containing the last true molar; from the Upper Eocene of Caylux. The tooth has the elongated form characteristic of this species and *H. cayluxi*; in the relatively greater depth of the jaw the present specimen agrees more nearly with *H. leptorhynchus* than with *H. cayluxi*. (*Vide* Filhol, Ann. Sci. Géol. vol. vii. art. 7, pp. 183, 206.) The dimensions of the specimen are compared below with those of the mandible of *H. leptorhynchus* described by Filhol, viz.:—

	Filhol.	B.M.
Length of carnassial	0,018	0,019
Height of first lobe of carnassial ..	0,010	0,010
„ second „ „ ..	0,006	0,007
Depth of jaw at carnassial	0,026	0,027

Purchased, 1884.

Hyænodon dubius, Filhol[1].

This species is about the size of *H. brachyrhynchus*; from which it is at once distinguished by the much greater vertical depth of the mandible.

Hab. France.

M. 1676. Fragment of the right ramus of the mandible, containing the third and fourth true molars; from the Upper Eocene

[1] Ann. Sci. Géol. vol. iii. art. 7, p. 29 (1872).

of Bach, near Lalbenque (Lot), France. This specimen is precisely similar to the one figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxv. figs. 182, 183, with the exception that the depth of the mandible is still greater in the present specimen, being 0,029 at the interval between $\overline{\text{pm. 3}}$ and $\overline{\text{pm. 4.}}$ *Purchased*, 1884.

M. 1677. Fragment of the right ramus of the mandible, containing the first and second true molars; from the Upper Eocene of Bach. This specimen agrees precisely with the one figured by Filhol in the plate cited above. *Purchased*, 1884.

Hyænodon vulpinus, P. Gervais [1].

Syn. *Hyænodon exiguus*, P. Gervais (*teste* Filhol).
Pterodon exiguus, P. Gervais.

This species is readily distinguished from any of the preceding by its greatly inferior size. The species has not hitherto been recorded from the Lower Miocene of Puy-de-Dôme.

Hab. France.

36766. Fragment of the cranium, containing all the teeth of the right side as far back as the first true molar, and a fragment of the right ramus of the mandible, containing the last premolar and the first and second true molars; from the Lower Miocene of Puy-de-Dôme, France [2]. The teeth are unworn and in beautiful preservation; and the specimen is valuable as showing the upper and lower jaws in association. The specimen is of considerably smaller size than the cranium of *H. vulpinum* figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxiv. fig. 170; but it will be seen, from the figures of three specimens of the mandible given on the same plate (figs. 167–169), that there is a considerable range of variation in size; and since the three teeth of the mandible of the present specimen agree precisely with the corresponding teeth of the specimen represented by Filhol in fig. 168, the present specimen may be pretty safely referred to the same species, thus extending its range into the Lower Miocene. The upper teeth agree exactly with those of the specimen No. M. 1678, noticed below. The following dimensions indicate the

[1] Journ. Zool. vol. ii. p. 374 (1873).

[2] The specimen is entered in the Museum Register as *Hyænodon croizeti*, Kaup; the name being apparently a manuscript one.

difference in the size of this specimen and the larger specimens described by Filhol in the Ann. Sci. Géol. vol. vii. art. 4, pp. 200–214, viz.:—

	B.M.	Filhol.
Upper teeth:		
Length of pm. 1	0,0065	0,0066
Height „	0,004	0,0069
Interval between pm. 1 and pm. 2	0,006	0,002
Length of pm. 2	0,009	0,0095
Height „	0,005	0,009
Length of pm. 3	0,011	0,01
Height „	0,005	0,0089
Length of pm. 4	0,009	0,0096
Height „	0,006	0,009
Length of m. 1	0,006	0,009
Height „	0,003	0,007
Interval between canine and m. 1	0,0475	0,037
Lower teeth:		
Length of pm. 4	0,015	0,009
Height „	0,008	0,0096
Length of m. 1	0,006	0,0065
Height „	0,004	0,0065
Length of m. 2	0,008	0,0085
Height „	0,006	0,0073

Purchased, 1859.

M. 1678. Fragment of the right maxilla, containing the third and fourth premolars and the two true molars; from the Upper Eocene of Bach. This specimen, with the exception of being slightly smaller, is very similar to the corresponding portion of a cranium figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxiv. fig. 170; but the last premolar is relatively smaller. *Purchased*, 1884.

M. 1679. Fragment of the right maxilla, containing the four premolars and the alveolus of the canine; from the Upper Eocene of Bach. This specimen is of the same size as the last, but corresponds otherwise to the cranium figured by Filhol (*loc. cit.*). *Purchased*, 1884.

M. 1680. The symphysis and part of the left ramus of the mandible, showing the premolars and the first true molar; from the Upper Eocene of Bach. This specimen is rather larger

than the mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxiv. fig. 169, but is otherwise similar. *Purchased*, 1884.

M. 1365. Symphysis of the mandible, showing the right canine, the first two premolars of either side, and a part of the left $\overline{\text{pm. 3}}$; from the Upper Eocene of Caylux. This specimen is rather smaller than the last, and agrees in size with the one figured by Filhol, *loc. cit.* fig. 167. *Purchased*, 1884.

M. 1681. Part of the right ramus of the mandible, containing the last premolar and the second and third true molars; from the Upper Eocene of Bach. This specimen agrees very closely with the mandible figured by Filhol, *loc. cit.* fig. 169. *Purchased*, 1884.

M. 1682. Part of the right ramus of the mandible, containing the first and second true molars, and the broken base of $\overline{\text{m. 2}}$; from the Upper Eocene of Bach. The teeth of this specimen agree in size with those of the last, but the depth of the jaw is considerably greater. *Purchased*, 1884.

M. 1683. Fragment of the left ramus of the mandible, containing the last true molar; from the Upper Eocene of Caylux. The tooth is smaller in this specimen than in any of those noticed above. *Purchased*, 1884.

M. 1684. Hinder portion of the cranium of a small *Hyænodon*, which may perhaps belong to the present species; from the Upper Eocene of Caylux. *Purchased*, 1884.

M. 1367. Fragment of the left ramus of the mandible, containing the last two premolars and the first true molar; from the Upper Eocene of Caylux. *Purchased*, 1884.

M. 1367 a. Fragment of the right ramus of the mandible, containing the last premolar and the first and second true molars; from the Upper Eocene of Caylux. *Purchased*, 1884.

M. 1367 b. Fragment of the left ramus of the mandible, containing the last premolar and the first true molar; from the Upper Eocene of Caylux. *Purchased*, 1884.

M. 1364. Fragment of the right ramus of the mandible, containing the last true molar; from the Upper Eocene of Caylux. *Purchased*, 1884.

M. 1379. The last right lower premolar; from the Upper Eocene of Caylux. *Purchased*, 1884.

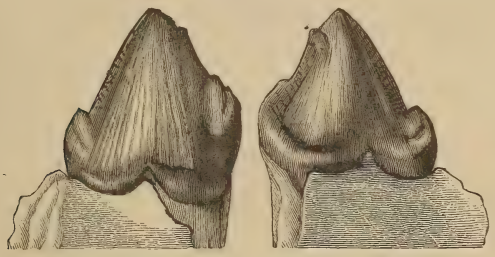
Hyænodon (?) sp.

(Cf. *Hyænodon indicus*, Lydekker[1].)

Hab. France and (?) India.

The species *H. indicus* was founded on the evidence of a fourth right lower premolar from the Pliocene Siwaliks of the Punjab, India, which indicates a species of very large size. This tooth is represented in the accompanying woodcut (fig. 1). At the same

Fig. 1.



Hyænodon indicus.—The fourth right lower premolar; from the Siwaliks of Kushalghar, Punjab. Indian Museum, Calcutta. ½. (From the 'Palæontologia Indica.')

time two other teeth, which were regarded as being third lower true molars, were described and figured ('Palæontologia Indica,' ser. 10, vol. ii. pl. xliii. figs. 5, 6), and provisionally referred to the same species, although it was suggested that they might possibly belong to a distinct species, or even genus. The most perfect of the two Indian teeth belongs to the left side, and was described in the following words, viz.:—"It is divided into two distinct lobes, of which the first is the stoutest: externally there is a stout cingulum forming the base of the crown. Posteriorly the lower border of the enamel of the crown runs suddenly upwards on both sides, nearly to the summit of the hind lobe." The tooth comes nearest to "the last lower true molar of *Hyænodon*[2]; in some species of which (e. g.

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 349 (1884).

[2] The tooth might be taken for the lower carnassial of a feline; but is distinguished by the form of the lower border of the enamel, and of the worn surfaces of the summits of the lobes, by the presence of the cingulum, and the size and direction of the fangs. In the large primitive felines (e.g. *Ælurogale intermedia*) there is a hind talon to the lower carnassial.

H. heberti, H. leptorhynchus) the lower border of the enamel bends upwards at the posterior extremity of the tooth in precisely the same manner, although not quite to the same extent, as in the Siwalik teeth. In none of the European or American species, however, is there the marked cingulum of the latter; while in all the larger forms the hinder lobe is relatively larger; although in the much smaller *H. crucians*, Leidy[1], the two lobes are more nearly of the same length. In all, the anterior lobe is much stouter than the posterior; and the wear of the summits of the lobes is similar to that of the Indian teeth." The length of the complete Indian tooth is 0,026.

M. 1685. (*Fig.*) The third right lower true molar; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This tooth, which is represented in the accompanying woodcut (fig. 2),

Fig. 2.

Hyænodon (?) sp.—The third right lower true molar; from the Upper Eocene of Bach. ½.

has lost the anterior fang, and agrees precisely, with the exception of its inferior size, with the Indian teeth noticed above. Its length is 0,020, and it evidently belonged to the same genus, if not to a smaller race of the same species, as the Indian specimens. It is different from the corresponding tooth of all the European species of *Hyænodon* described by Filhol, and presents no resemblance to *Proviverra, Pterodon*, or *Oxyæna*; while the writer has been unable to identify it with any of the allied genera from the American Tertiaries. To whatever genus it really belongs, the occurrence in the Lower Tertiaries of

[1] Journ. Ac. Nat. Sci. Philadel. vol. vii. pl. ii.

France and the Upper Tertiaries of India of this peculiar form of tooth is a very interesting and noteworthy circumstance, and affords a well-marked instance of the survival in India and other eastern regions of forms which disappeared at a much earlier period in Europe.

Purchased, 1884.

Genus **PTERODON**, Blainville[1].

Dentition[2]:—I. $\frac{(2-3)}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{(3-4)}$, M. $\frac{3}{3}$. Cope places this genus and *Oxyæna* in a distinct family—*Oxyænidæ*.

Pterodon dasyuroides, Blainville[3].

Syn. *Pterodon parisiensis*, Blainville[4].
(?) *Pterodon cuvieri*, Pomel[5].
(?) *Pterodon coquandi*, Pomel[6].

Hab. Europe.

M. 1361. Fragment of the right maxilla, containing the first and second true molars, in an almost unworn condition; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. These teeth are rather larger than those of a fine cranium figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. ii. *Purchased*, 1884.

27579. Fragment of the right maxilla, containing the last premolar and the three true molars, in a partially worn condition; from the Upper Eocene of Débruge, near Apt (Vaucluse), France. The teeth of this specimen (which apparently corresponds to *P. cuvieri*, Pomel) are considerably smaller than those of the last specimen, but do not present any structural difference, and seem to belong to a smaller race of the same species. *Bravard Collection*. *Purchased*, 1852.

M. 1689. Part of the left maxilla, containing the three true molars; from the Upper Eocene of Bach, near Lalbenque (Lot), France. The teeth of this specimen are slightly smaller

[1] Ann. Fr. et Etr. d'Anat. et de Physiol. vol. iii. p. 23 (1839), *teste* P. Gervais.

[2] Cope (Amer. Nat. 1884, p. 481) gives the number of the cheek-teeth simply as Pm. $\frac{3}{3}$, M. $\frac{3}{3}$. There are, however, seven of these teeth in typical examples of *P. dasyuroides*; *vide* Filhol, Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. ii.

[3] *Loc. cit.* [4] Ostéographie, genus *Subursus*, p. 48 (1841).

[5] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 392 (1846).

[6] Catalogue Méthodique, p. 117 (1853).

than those of the cranium figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. ii. *Purchased*, 1884.

M. 1690. Fragment of the right maxilla, containing the second and third true molars; from the Upper Eocene of Bach. The teeth are slightly larger than those of the last. *Purchased*, 1884.

M. 1691. Detached teeth; from the Upper Eocene of Jamblouise, near Limogne (Lot), France. *Purchased*, 1884.

27578. Fragment of the right maxilla, containing the second and fourth premolars and the first and second true molars; from the Upper Eocene of Débruge. This specimen agrees with the last. *Bravard Collection. Purchased*, 1852.

26759. Fragment of the left maxilla, containing the three true molars, the first in a well-worn condition; from the Upper Eocene of Vaucluse. *Pomel Collection. Purchased*, 1851.

28152. Cast of the dental portion of the maxilla, showing most of the teeth; the original is from the Upper Eocene of Débruge[1]. The teeth of this specimen agree exactly in size with those of the above-mentioned cranium figured by Filhol. *Bravard Collection. Purchased*, 1852.

27577. The second or third left lower true molar[2], in a well-worn condition; from the Upper Eocene of Débruge. The talon is relatively small. *Bravard Collection. Purchased*, 1852.

36947. Three specimens of the second or third lower true molar, two of which have lost their talons; from the Bembridge Limestone (Upper Eocene) of the Isle of Wight. These specimens appear to agree exactly with specimens figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxxiii. figs. 164, 188; and there can be no doubt as to the generic reference. These specimens (which have been previously noticed by the present writer in the Geol. Mag. dec. 3, vol. i. p. 444) are important as proving the occurrence of the genus in England. *Purchased*, 1861.

28153. A canine[3]; from the Upper Eocene of Vaucluse. This

[1] This specimen is entered in the Museum Register as *Pterodon laurillardi*, Bravard & Pomel, which is apparently a manuscript name.

[2] Entered in the Museum Register as *P. laurillardi*.

[3] Entered in the Museum Register as *P. laurillardi*.

specimen is referred to the present genus on the authority of Bravard. *Bravard Collection. Purchased*, 1852.

28163–4. Three lower premolars[1] of small size, not improbably belonging to a small race of the present species; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

28154. Cast of a portion of the right ramus of the mandible, showing the last three premolars: the original is from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

M. 1719. Fragment of the left ramus of the mandible of a large-sized individual, containing the two last molars; and a fragment of the anterior part of a ramus with two worn teeth; from the Upper Eocene of Bach. *Purchased*, 1884.

Genus **OXYÆNA**, Cope[2].

This genus is apparently distinguished from *Pterodon* merely by the absence of the third molars in both jaws, and by the diminution in the number of the incisors. Since one species of *Pterodon* (*P. biincisivus*) has only two pairs of incisors in the upper jaw, and possibly only the same number in the mandible, there is a transition in this respect towards the present genus; and as the only other distinction is the absence of the last true molars, the writer is strongly inclined to think that *Oxyæna* might be merged in *Pterodon*. The following formula[3] represents the range of variation in the number of teeth of *Oxyæna*, viz. I. $\frac{(2-3)}{0}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{2}$.

Oxyæna galliæ, Filhol[4].

Dentition:—I. $\frac{2}{0}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{2}$. Filhol founded this species on a fragment of the maxilla in which the incisors were not shown. He was not, therefore, aware that these teeth were only two in number, in place of three, as in the American species.

Hab. France.

[1] Entered in the Museum Register as *P. aymardi*, Bravard, MS.

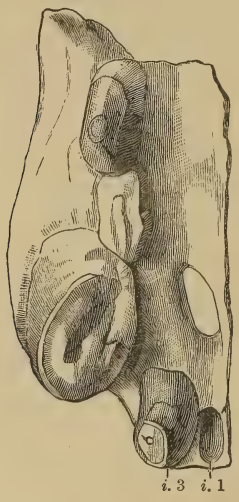
[2] Report U.S. Geogr. Surv. W. of 100th Meridian, 1874, p. 11. Vert. Foss. New Mexico.

[3] In his latest notice (Amer. Nat. 1884, p. 480) Cope gives the number of cheek-teeth as Pm. $\frac{3}{4}$, M. $\frac{3}{3}$. The figure of the upper dentition given on the opposite page of his memoir shows, however, that this is incorrect.

[4] Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 34.

M. 1692. (*Fig.*) The extremity of the muzzle; from the Upper Eocene of Mouillac, near Caylux (Tarn-et-Garonne), France. This specimen [1], of which the palatal aspect of one side is represented in the woodcut (fig. 3), shows on the left side the

Fig. 3.



Oxyæna gallicæ.—Anterior part of the left half of the palate; from the Upper Eocene of Mouillac. ½.

alveoli of the two incisors (of which the outer is much larger than the inner), the canine (with the greater part of the crown broken away), and the first and second premolars. There is a small interval between the outer incisor and the canine; the first premolar (which has but one root) is in apposition to the canine; and the second premolar (which has two roots) is very close to the first. In the following table the dimensions of this specimen are compared with those of the type specimen as given by Filhol, viz.:—

	B.M.	Filhol.
Antero-posterior diam. of base of canine .	0,021	0,020
Transverse „ „ „ „ .	0,014	0,012
Antero-posterior diam. of base of pm. 1 . .	0,012	0,006
„ „ „ pm. 2 . .	0,0135	0,0137

[1] This specimen has been previously noticed and figured by the present writer in the Geol. Mag. dec. 3, vol. i. p. 445.

	B.M.
Antero-posterior diam. of alveolus of inner incisor	0,008
Antero-posterior diam. of alveolus of outer incisor	0,013
Interval between canines	0,026

It will be seen that the only difference in the two specimens consists in the superior size of the first premolar in the present specimen. *Purchased*, 1884.

M. 1693. The symphysis of the mandible; from the Upper Eocene of Escamps, near Lalbenque (Lot), France. This specimen shows the alveoli of the canines and the first premolars, the second premolars, and parts of the third. The dimensions are as follows:—

Length of symphysis superiorly	0,067
Vertical diameter of alveolus of canine	0,019
Transverse „ „ „	0,013
Length of crown of pm. 2	0,0158

This specimen is important, because no portion of the mandible has been described by Filhol. It is considerably larger than the mandible of *O. forcipata*, Cope [1], which is the largest American species, and the incisors appear to have been inclined more directly forwards.

Purchased, 1884.

Limb-bones of Hyænodontidæ [2].

A large series of limb-bones probably belonging to this family are contained in the Museum, and many of these have been labelled *Hyænodon* or *Pterodon*. There do not appear, however, to be any reasons known for assigning any of them to one genus rather than to the other; and they are accordingly entered here merely as belonging to the family, although suggestions are in some instances made as to the species to which they may possibly belong.

28165. Glenoidal extremity of the right scapula of a large species; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

27576. The greater portion of the right humerus of a large species;

[1] In the Report U.S. Geogr. Surv. W. of 100th Meridian, vol. iv. pt. 2, pl. xxxvi. (1877), a fine specimen of the mandible is figured.

[2] These specimens are mainly referred to this family on the authority of Bravard.

from the Upper Eocene of Vaucluse. There is a large entepicondylar foramen.

Bravard Collection. Purchased, 1852.

28187. The imperfect distal portion of the left humerus of a large species, different from the last; from the Upper Eocene of Vaucluse. It is not improbable that this specimen and the last respectively belong to *H. brachyrhynchus* and *P. dasyuroides*. *Bravard Collection. Purchased*, 1852.

26758. The broken distal portion of the right humerus, apparently similar to No. 27576; from the Upper Eocene of Vaucluse.

Pomel Collection. Purchased, 1851.

28166. The greater portion of the broken right humerus of a large species; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

28167. The greater portion of the left humerus of a smaller form; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

27709. The greater portion of the right humerus of a small species; from the Lower Miocene of Sauvetat, Puy-de-Dôme. It is not improbable that this specimen may belong to *H. vulpinus*. *Croizet Collection. Purchased*, 1848.

28188. The greater portion of the right ulna of a large species; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

26760. The proximal half of the left ulna, slightly smaller than the last; from the Upper Eocene of Vaucluse.

Pomel Collection. Purchased, 1851.

28168. The lesser sigmoidal fossa of the right ulna, similar to the last specimen; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

11909. Cast of the right ulna, wanting the distal epiphysis. The original is from the Upper Eocene of Paris, and is figured in De Blainville's 'Ostéographie' (genus *Subursus*), pl. xii., under the name of *Taxotherium parisiense*. It is of the same size as the last two specimens.

Mantell Collection. Purchased, 1836.

29869. The right radius of a small species; from the Headon beds (Upper Eocene) of Hordwell, Hampshire. This bone is too small to have belonged to *Hyænodon minor* (unless

that species varied greatly in size), and more nearly corresponds to *H. vulpinus*. It probably belongs to the same species as a femur from the same locality noticed below, and would seem to indicate a second British species of *Hycænodon*, since no small forms of *Pterodon* are known.
Hastings Collection. Purchased, 1855.

28155. The left radius of a large species, imperfect distally; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

28169. The left radius, slightly smaller than, but otherwise similar to, the last specimen; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

26759. The right radius, similar in size to the last, but with a squarer proximal articular surface; from the Upper Eocene of Vaucluse. *Pomel Collection. Purchased*, 1851.

28239. The left radius, similar in size to the last two specimens, but with the distal articular surface more elongated; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

28289. The right radius, agreeing in size and the form of the proximal articular surface with No. 26759; from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

28210. The greater portion of the right radius of a smaller form; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

28196. Distal two thirds of the radius of a small form; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

27583. The bones of the right fore-foot of a medium-sized form; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

26751. The three inner right metacarpals of a larger form; from the Upper Eocene of Vaucluse.
Pomel Collection. Purchased, 1851.

26752. The left scapho-lunar; from the Upper Eocene of Vaucluse.
Pomel Collection. Purchased, 1851.

28193. The distal half of the femur of a large specimen, in a much-crushed condition; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

29726. The left femur of an animal probably belonging to the present family; from the Headon beds (Upper Eocene)of Hordwell, Hampshire. This bone indicates a small species and corresponds in size to the ulna, No. 29869. Its extreme length is 0,127, and the width of the distal extremity 0,027. The larger and smaller trochanters are strongly developed, and there is a very distinct ridge on the upper portion of the outer border, foreshadowing a third trochanter. *Hastings Collection. Purchased*, 1855.

28195. The left tibia of a large species, in a much-crushed condition; from the Upper Eocene of Vaucluse. The cnemial crest extends far down the shaft.
Bravard Collection. Purchased, 1852.

30132. The greater portion of the left tibia of a small species; from the Headon Beds of Hordwell. This specimen agrees in relative size with the femur, No. 29726: it exhibits an elongated cnemial crest.
Hastings Collection. Purchased, 1855.

27582. The distal extremity of the right tibia of a large species; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

26750. The right calcaneum of a large species; from the Upper Eocene of Vaucluse. *Pomel Collection. Purchased*, 1851.

27581, 28197. Two specimens of the left astragalus of a large species; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

28162, 28170. Two specimens of the four metatarsals; from the Upper Eocene of Vaucluse.
Bravard Collection. Purchased, 1852.

30342. Three terminal phalangeals, very probably belonging to the present genus; from the Headon beds of Hordwell.
Hastings Collection. Purchased, 1855.

Serial position uncertain.

Genus **ARGILLOTHERIUM,** Davies[1].

This genus has been established on the evidence of the cranium noticed below, the teeth of which are unfortunately wanting. The describer considered that it might be allied to the Canoids; but the

[1] Geol. Mag. dec. 3, vol. i. p. 438 (1884).

present writer thinks it may possibly be intermediate between some of the Carnivora Primigenia (like the N. American *Mesonyx*) and the Carnivora Vera. The brain-case is larger than in *Mesonyx*, and the dentition less numerous and more macrodont.

Argillotherium toliapicum, Davies [1].

Hab. England.

35688. Part of the cranium, showing portions of the parietals, the maxillæ, palatals, pterygoids, and presphenoid; from the Lower Eocene (London Clay) of the Isle of Sheppey. The alveoli of pm. 3, pm. 4, and m. 1 are shown; if m. 2 was present it must have been very small. This specimen is the type, and is described by Davies in the passage cited. *Purchased*, 1859.

Suborder *CARNIVORA VERA.*

The true Carnivora which come nearest to the Carnivora Primigenia are some of the Viverro-canoids; but it is necessary that these should be placed near the middle of the suborder. The juxtaposition of the Felidæ to the Carnivora Primigenia does not therefore indicate any close relationship between the two.

Family FELIDÆ.

This family is taken to include the *Nimravidæ* of Cope as well as the typical felines[2].

Genus **MACHÆRODUS,** Kaup[3].

Syn. *Agnotherium*, Kaup [4].
Cultridens, Croizet [5].
Drepanodon, auct.[6]
Meganthereon, Pomel [7].
Smilodon, Lund [8].

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[1] Geol. Mag. dec. 3, vol. i. p. 438 (1884).

[2] *Vide* Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 313 (1884).

[3] Oss. Foss. d. Darmstadt, pt. 2, p. 24 (1833), *Machairodus*.

[4] *Ibid.* p. 28 (1833).

[5] In Huot's 'Nouveau Cours Elémentaire de Géologie,' vol. i. p. 265 (1837).

[6] Given in 1826 as a specific name by Nesti.

[7] Catalogue Méthodique, p. 58 (1853). Originally given by Croizet and Bravard as a specific name.

[8] K. Danske Vid. Selsk. Skr. vol. ix. p. 293 (1842).

Steneodon, Croizet[1].
Trucifelis, Leidy (*teste* Cope).

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{2}{(1-2)}$, M. $\frac{1}{1}$.

Machærodus meganthereon (Croizet and Jobert[2]).

Syn. *Drepanodon meganthereon*, Cope.
Felis meganthereon, Croizet and Jobert[3].
Felis meganthereon, Bravard[4].
Meganthereon macrocelis, Pomel[5].
Steneodon meganthereon, Croizet[6].

Hab. S. Europe.

28882. Cast of the cranium and the right ramus of the mandible. The original is from the Upper Pliocene of Mont Perrier, near Issoire (Puy-de-Dôme), France, and is in the Paris Museum: it is figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxvii. figs. 1, 2. It shows pm. 3 and pm. 4 on the left, and pm. 4 on the right side; there is an alveolus for m. 1. *Bravard Collection. Purchased*, 1852.

15433. The right upper canine, wanting the lower half; from the Pliocene of the Val d'Arno, Italy. This specimen belongs to a larger individual than the last.
McEnery Collection. Purchased, 1842.

Machærodus cultridens (Cuvier[7]).

Syn.[8] *Agnotherium antiquum*, Kaup (*in parte*).
Cultridens arvernensis, Croizet.
Drepanodon aphanista, Cope.
Felis aphanista, Kaup.
Felis cultridens, Bravard.
Felis gigantea, Wagner.
Machærodus leoninus, Roth and Wagner.
Meganthereon aphanista, Pomel.
Meganthereon cultridens, Pomel.
Steneodon cultridens, Croizet.

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[1] Revue Encyclopédique, vol. lix. p. 76 (1833) (*teste* E. Geoffroy). This name has the same date as *Machærodus*.
[2] Oss. Foss. d. Puy-de-Dôme, vol. i. p. 215 (1828), *Felis*.
[3] *Loc. cit.*
[4] Monographie de deux *Felis* d'Auvergne, p. 143 (1828).
[5] Catalogue Méthodique, p. 55 (1853).
[6] Revue Encyclopédique, *op. cit.*
[7] Ossemens Fossiles, vol. v. pt. 2, p. 517 (1824), *Ursus*.
[8] The synonymy is taken from Gaudry's 'Animaux fossiles et Géologie de l'Attique,' p. 105, where full quotations are given.

Ursus cultridens, Cuvier.
Ursus cultridens arvernensis, Cr. and Jobert.
Ursus drepanodon, Nesti.

Hab. S. Europe.

59674. Cast of the dental portion of the upper and lower jaws. The original is from the Lower Pliocene of Pikermi, Attica, and is preserved in the Museum at Munich; it is figured by Roth and Wagner in the Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. vii. pl. ix. fig. 1, under the name of *M. leoninus*, and by Kaup in the 'Beiträge,' pt. 5, pl. ii. fig. 2 (1861), under the name of *M. cultridens*. The specimen exhibits pm. 3 and pm. 4, and the three mandibular cheek-teeth. *Purchased*, 1879.

11929. Cast of the left upper canine. The original is from Puy-de-Dôme (? Lower Pliocene), and is preserved in the Paris Museum; it is figured by De Blainville in the 'Ostéographie,' genus *Felis*, plate xvii.
Mantell Collection. Purchased, 1836.

49674. Cast of the right ramus of the mandible. The original is from the Lower Pliocene of Pikermi, and is preserved in the Museum at Munich. It is figured by Wagner in the Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. vii. pl. v. fig. 11, under the name of *M. leoninus*. From its slender form and small canine, this specimen may probably be referred to a female. *Purchased*, 1879.

49967 a. Anterior portion of the left ramus of the mandible; from the Upper Miocene of Eppelsheim, Hesse Darmstadt. The crown of the canine, and the summits of pm. 4 and m. 1 are broken away, but m. 1 is perfect. This specimen belongs to Kaup's so-called *Felis aphanista*; but appears to differ in no respect from the mandible of No. 49674. *No history.*

M. 413. Cast of part of the right ramus of the mandible. The original is from the Upper Miocene of Eppelsheim.
Egerton Collection. Purchased, 1882.

40873. A fragment of the upper canine of a *Machærodus*, probably belonging to the present species; locality unknown.
Presented by C. Falconer, Esq., 1867.

28845 x. Wax model of a right upper canine, of comparatively small size. The original is from the Lower Pliocene of the Val d'Arno, Italy. *Presented by J. B. Pentland, Esq.*, 1853.

Machærodus latidens, Owen[1].

Syn. *Drepanodon latidens,* Cope.
Meganthereon latidens, Pomel.

Hab. England.

46842. Cast of the right upper canine; from Kent's-Hole Cavern, Torquay, Devon. The original of this specimen is preserved in the Museum of the Royal College of Surgeons (no. 443), and is figured by Owen in the 'British Fossil Mammals and Birds,' p. 180. *Presented by Professor Flower,* 1875.

14954. (*Fig.*) Left upper canine; from Kent's-Hole Cavern. This specimen is figured by Dawkins and Sanford in their 'Monograph of the British Pleistocene Mammalia' (Palæontographical Society, 1872), p. 184, pl. xxv. figs. 1–3; and is mentioned by Falconer in a note published in the 'Palæontological Memoirs,' vol. ii. p. 461, who remarks on its excessively crenulated edges.
Presented by Dr. L. Phillips, by whom it was purchased at the sale of the McEnery Collection in 1842.

46842 a. Cast of the upper canine; from Kent's-Hole Cavern.
No history.

46767. Cast of the third left upper incisor; from Kent's-Hole Cavern. The original of this specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 182, and is in the Albert Museum, Exeter[2]. *Made by permission of the Committee of the Albert Museum, Exeter.*

M. 582. The third right upper incisor; from Kent's-Hole Cavern. This specimen is mentioned by Pengelly in Brit. Assoc. Rep. 1872, p. 46 (No. 5962). *Presented by Lord Haldon,* 1883.

Machærodus sivalensis (Falconer and Cautley[3]).

Syn. *Drepanodon sivalensis,* Falc. and Caut.[4]
Meganthereon falconeri, Pomel[5].
Machærodus falconeri, Gaudry[6].

Hab. India.

[1] British Fossil Mammals and Birds, p. 179 (1846).

[2] In the 'Catalogue of the Osteological Specimens in the Royal College of Surgeons,' Pt. II. Mammalia, p. 92 (1884), this specimen (No. 445, cast) is stated to be in the British Museum.

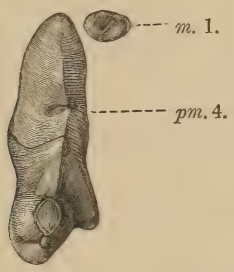
[3] Palæontological Memoirs of Hugh Falconer, vol. i. p. 550 (1868), *Drepanodon.*

[4] *Loc. cit.* [5] Catalogue Méthodique, p. 56 (1853).

[6] Animaux fossiles et Géologie de l'Attique, p. 113.

39730. (*Fig.*) Fragment of the left maxilla, containing pm. 3, pm. 4, and m. 1; from the Pliocene of the Siwalik Hills, India. This specimen, of which the last two teeth are represented in the accompanying woodcut (fig. 4), has been described and

Fig. 4.



Machærodus sivalensis.—Posterior left upper cheek-teeth; from the Pliocene of the Siwalik Hills. ½. (From the 'Palæontologia Indica.')

figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 338, pl. xliv. fig. 4, and is also figured in plate N. figs. 5, 5*a* of the 'Fauna Antiqua Sivalensis.' It exhibits the small pm. 3 characteristic of the species, of which this and the following specimens are the types. *Cautley Collection. Presented*, 1842.

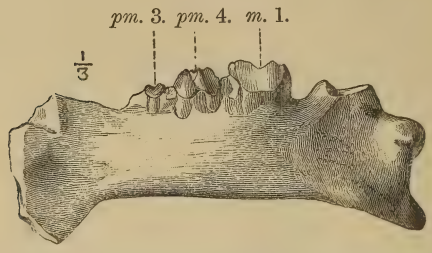
16350. (*Fig.*) Fragment of the right maxilla of a young individual, showing the milk-canine, the penultimate milk-molar, and the alveolus of the last milk-molar; from the Pliocene of the Siwaliks. This specimen is figured in the 'Fauna Antiqua Sivalensis,' plate N. figs. 3, 3*a*; in 'Falconer's Palæontological Memoirs,' vol. i. pl. xxv. fig. 5; by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. pl. vi. fig. 5; and by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xliv. figs. 1, 1*a*.

Cautley Collection. Presented, 1842.

16557. (*Fig.*) The middle portion of the left ramus of the mandible of a female; from the Pliocene of the Siwalik Hills. This specimen has been described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xliv. figs. 4, 4*a*; and is also figured in the 'Fauna Antiqua Sivalensis,' pl. N. fig. 6, and in Falconer's 'Palæontological Memoirs,' vol. i. pl. xxv. fig. 6. It shows pm. 4 and m. 1, and the broken base of pm. 3. The specimen of the

mandible of a male, figured in the accompanying woodcut (fig. 5), shows the larger symphysial expansion characteristic of that sex. *Cautley Collection. Presented*, 1842.

Fig. 5.



Machærodus sivalensis.—Outer view of the left ramus of the mandible of a male; from the Siwalik Hills. Dublin Museum. (From the 'Palæontologia Indica.')

16554. (*Fig.*) The middle portion of the right ramus of the mandible; from the Pliocene of the Siwalik Hills. This specimen is figured in the 'Fauna Antiqua Sivalensis,' pl. N. figs. 8, 8 *a*, and is briefly mentioned by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 336.

Cautley Collection. Presented, 1842.

Machærodus palæindicus, Bose[1].

Hab. India.

48436. (*Fig.*) Symphysial extremity of the left ramus of the mandible, showing the alveoli of an incisor, the canine, and $\overline{\text{pm. 3}}$, with the broken crown of $\overline{\text{pm. 4}}$; from the Pliocene of the Siwalik Hills, India. This specimen, which is the type of the species, is described and figured by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 125, pl. vi. figs. 1–3; and by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 341, pl. xliv. fig. 3. The species seems more nearly allied to the last Siwalik species and the American forms than to any of the European species; although in the structure of the mandible and $\overline{\text{pm. 3}}$ it presents certain indications of affinity with the latter.

Presented by C. Falconer, Esq., 1867.

48437. (*Fig.*) Part of the right ramus of the mandible, containing $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$; from the Pliocene of the Siwalik Hills. This specimen is figured by Bose in the Quart. Journ. Geol.

[1] Quart. Journ. Geol. Soc. vol. xxxvi. p. 125 (1880).

Soc. vol. xxxvi. pl. vi. fig. 4; and is described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 341. *Presented by C. Falconer, Esq.*, 1867.

M. 1567. (*Fig.*) Fragment of the right ramus of the mandible, containing the broken $\overline{\text{pm. 4}}$ and the roots of $\overline{\text{pm. 3}}$; from the Pliocene of the Siwalik Hills. This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 341, pl. xliii. fig. 8. *Cautley Collection. Presented*, 1842.

39728. (*Fig.*) Occipital portion of the cranium; from the Pliocene of the Siwalik Hills. This specimen is described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 343; and is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. N. figs. 1, 1 *a*, 1 *b*, 1 *c*. *Cautley Collection. Presented*, 1842.

39729. (*Fig.*) A much-damaged cranium, probably belonging to this species; from the Pliocene of the Siwalik Hills. This specimen is mentioned by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 344; and is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. N. fig. 2. *Cautley Collection. Presented*, 1842.

Undetermined Specimens.

43525. Hinder portion of a cranium; from the Pliocene of the Siwalik Hills. This undescribed specimen indicates an individual of gigantic size, larger even than *M. neogæus*. It differs in some respects from No. 39728; but both specimens are too imperfect to determine whether they belong to the same species. *Cautley Collection. Presented*, 1842.

49177. Occipital portion of a cranium; from the Pliocene of the Siwaliks. This specimen is in too imperfect condition to determine whether it belongs to the present genus or to *Felis*. *Cautley Collection. Presented*, 1842.

Machærodus neogæus (Lund[1]).

Syn. *Felis smilodon*, Blainville.
Hyæna neogæa, Lund[2].
Meganthereon neogæus, Pomel.

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[1] K. Dankse Vid. Selsk. Skr. vol. viii. p. 94 (1841), memoir dated 1837, *Hyæna*.

[2] *Loc. cit.*

Smilodon neogæus, Cope.
Smilodon populator, Lund[1].

Hab. S. America.

21000. The cranium and mandible, wanting the maxillæ and the left premaxilla; from the Pleistocene of Buenos Ayres. The upper portion of the left canine remains; there are only two cheek-teeth on each side of the mandible.

Purchased, 1846.

M. 1572. Cast of the cranium and mandible; from a cavern in Minas Geraes, Brazil. The original of this specimen (from which the woodcut fig. 6 is modified) is in the Paris

Fig. 6.

Machærodus neogæus.—Cranium, much reduced; from South America.

Museum; and is figured by De Blainville in his 'Ostéographie,' genus *Felis*, pl. xx. A small $\overline{\text{pm. 3}}$, of different sizes on the two sides, is present in the mandible.

No history.

43235. The left ramus of the mandible, wanting the cutting-teeth; from the Pleistocene of Buenos Ayres. In this specimen $\overline{\text{pm. 3}}$ is absent. *Presented by Señor L. J. Fontana*, 1871.

43236. The left ramus of the mandible, wanting the cutting-teeth; from the Pleistocene of Buenos Ayres. In this specimen the teeth are in beautiful preservation; $\overline{\text{pm. 3}}$ is present, and is of considerably larger size than in the Paris skull (No. M. 1572). *Presented by Señor L. J. Fontana*, 1871.

[1] *Loc. cit.* vol. ix. p. 293 (1842).

18972. The associated third and fourth left upper premolars; from a cavern in Minas Geraes, Brazil. This specimen, with the bones under the same number, is believed to belong to the same individual as the Paris skull (No. M. 1572).
Claussen Collection. Purchased, 1845.

18972 a. Shaft of the left femur, associated with No. 18972.

18972 b. The greater part of the right humerus, broken off inferiorly at the entepicondylar foramen; associated with No. 18972.

18972 c. The right ulna, wanting the proximal articular extremity; associated with No. 18972.

18972 d. The distal extremity of the right tibia; associated with No. 18972.

18972 e. The right astragalus; associated with No. 18972.

18972 f. A phalangeal bone; associated with No. 18972.

18972 g. Three cervical vertebræ; associated with No. 18972.

18975. The right calcaneum; from a cavern in Minas Geraes, Brazil. *Claussen Collection. Purchased*, 1845.

32993. The centrum of a dorsal vertebra; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

32992. The proximal half of the right radius; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

43234. The left femur, wanting the articular extremities; from the Pleistocene of Buenos Ayres. This bone is of rather more slender form than No. 18972 *a*.
Presented by Señor L. J. Fontana, 1871.

39400. Distal extremity of a right femur, probably belonging to the present species; from the Pleistocene of the Rio Negro, Uruguay. This bone is apparently very similar to the last. *Presented by D. A. Stoddart, Esq.*, 1865.

21000 i. The root of an upper canine, of enormous size; from the Pleistocene of Buenos Ayres. The crown of this specimen appears to have been broken off during the life of the animal. *Purchased*, 1846.

Genus **FELIS**, Linn.[1]

(including *Leo, Leopardus, Lynx, Tigris, Uncia,* &c.).

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(2-3)}{2}$, M. $\frac{1}{1}$.

Felis leo, Linn.[2]

Syn. *Felis spelæa*, Goldf.[3]

Hab. Africa and South-western Asia (Recent); Europe (Pleistocene).

28553. (*Fig.*) The nearly complete cranium and mandible, wanting the zygomatic arches, two upper incisors, and the first and second upper premolars of either side; from the Gailenreuth Cave, Franconia. This specimen is described and figured by Owen in the Phil. Trans. 1859, p. 317, pl. xii. figs. 1, 1*a*. *Purchased*, 1853.

17921. (*Fig.*) Part of the right maxilla and premaxilla, containing the third incisor, canine, $\overline{\text{pm. 3}}$, and $\underline{\text{pm. 4}}$, from Kent's-Hole Cavern, Torquay. This specimen belonged to a male, and is described and figured in Owen's 'British Fossil Mammals and Birds,' pp. 161, 164, fig. 63; and is described in Dawkins and Sanford's 'British Pleistocene Mammalia' (Pal. Soc. 1866), p. 31.
McEnery Collection. Purchased, 1842.

43681. The right upper canine; from the cavernous fissures of Oreston, near Plymouth; identical in form with the corresponding tooth of No. 17921. *Purchased*, 1872.

40967. Two fragments of the right ramus of the mandible, containing the canine and the third and fourth premolars, in an unworn condition; from the Pleistocene of Crayford, Kent. *Purchased*, 1868.

44920. The anterior half of the right ramus of the mandible; from the Pleistocene of Ilford, Essex. The specimen is broken off behind the carnassial; and, with the exception of a portion of the last premolar, the crowns of all the cheek-teeth are wanting; the symphysis is entire, and there are three mentary foramina. This specimen is noticed by Dawkins and Sanford in their 'Monograph of the British Pleistocene Mammalia' (Pal. Soc. 1866), pt. 1, p. 4, and

[1] Syst. Nat. ed. 12, vol. i. p. 60 (1766). [2] *Loc. cit.*
[3] Nova Acta Ac. Cæs. Leop.-Car. vol. x. p. 489 (1821).

is No. A 1 of Davies's 'Catalogue of the Brady Collection' (1874). *Brady Collection. Purchased*, 1878.

44921. The second phalangeal of the second digit of the left fore-foot; from the Pleistocene of Ilford. This specimen is No. A 2 of the Catalogue cited above.
Brady Collection. Purchased, 1878.

48691. Fragment of the right maxilla, showing part of the alveolus of the canine, the alveolus of pm. 2, and the complete pm. 3; from Brixham Cave, near Torquay.
Brixham-Cave Collection. Presented, 1876.

48687. (*Fig.*) The corresponding portion of the left maxilla to No. 48691, showing the same teeth; from Brixham Cave. This specimen is figured by Busk in the Phil. Trans. for 1873, pl. xlv. fig. 4. *Brixham-Cave Collection. Presented*, 1876.

48688. The left premaxilla, containing the outer incisor, and the bases of the other two teeth of the same series; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

48690. (*Fig.*) The right upper carnassial, in a much-worn condition; from Brixham Cave. This specimen is figured by Busk, *loc. cit.* fig. 6. *Brixham-Cave Collection. Presented*, 1876.

34 (O. C.). A part of the left maxilla, containing the much-worn pm. 4, and the alveoli of the canine and the other cheek-teeth; from a cavern in Muggendorf, Franconia.
Presented by W. Salmond, Esq. Before 1836.

M. 179. The right upper canine, with the enamel of the crown broken; from the cave of Durdham Down, Gloucestershire.
Enniskillen Collection. Purchased, 1882.

M. 176. The right upper canine; from Kent's-Hole Cavern.
Enniskillen Collection. Purchased, 1882.

M. 180. The right upper canine; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 177. Three specimens of the upper carnassial; from Kent's-Hole Cavern. *Enniskillen Collection. Purchased*, 1882.

M. 181. Three specimens of the upper carnassial, and one third premolar; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 369. The right lower carnassial, of very large size, and much worn; from a cave at Adelsberg.
Egerton Collection. Purchased, 1882.

M. 178. The left lower carnassial; from Kent's-Hole Cavern.
Enniskillen Collection. Purchased, 1882.

M. 178 a. The third and fourth lower premolars; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 369. The third and fourth right lower premolars; from a cave at Adelsberg. *Egerton Collection. Purchased*, 1882.

48683. A left outer incisor; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

48689. (*Fig.*) A canine; from Brixham Cave. This specimen is figured by Busk in the Phil. Trans. for 1873, pl. xlv. fig. 5.
Brixham-Cave Collection. Presented, 1876.

48686. A canine; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

16691. Two specimens of the lower carnassial of opposite sides; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

17921. The left lower carnassial; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

43191. The left upper canine, of an extremely small individual (determined by Falconer); locality unknown.
Wetherell Collection. Purchased, 1871.

28554. The greater portion of the right ramus of the mandible, showing the canine (broken) and cheek-teeth; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

M. 272. The greater portion of the right ramus of the mandible, showing the canine and cheek-teeth; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

M. 273. The perfect left upper canine, exhibiting very clearly the vertical groovings on the outer and inner surfaces; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1852.

40951. (*Fig.*) The left lower canine of a *Felis*; from the cavern of "North Hill Tor," Gower, Glamorganshire. This specimen is figured in 'Falconer's Palæontological Memoirs,' vol. ii. pl. xxxvi. figs. 5 & 6, and is said by Falconer (*ibid.* p. 457) to resemble very closely the corresponding tooth of a young

Lion; it not improbably belongs to a small individual of the present species. *Presented by Gen. Wood*, 1865.

M. 209. A right upper canine tooth, from the Gailenreuth Cave; probably belonging to the milk-dentition of this species. *Enniskillen Collection. Purchased*, 1882.

M. 186. The glenoidal half of the left scapula; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 187. The left humerus, wanting the distal extremity; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 271. Middle portion of the shaft of the left humerus, in a much-rolled condition; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

28041. The distal extremity of the right humerus; from the Pleistocene of Clacton, Essex. *Presented by J. Brown, Esq.*, 1852.

23735 c. The distal extremity of the left humerus; from the Pleistocene of Slade Green, near Erith, Kent. *Purchased*, 1852.

43685. The broken distal extremity of the right humerus; from the cavernous fissures of Oreston. *Purchased*, 1849.

40875. The left radius of a large individual. The locality of this fine specimen is unknown. *Presented by C. Falconer, Esq.*, 1867.

43686. Two specimens of the proximal extremity of the radius belonging to opposite sides; from the cavernous fissures of Oreston. *Purchased*, 1872.

43687. The distal extremity of the radius; from the cavernous fissures of Oreston. *Purchased*, 1872.

M. 207. The right scapho-lunar; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882

43698. The left scapho-lunar: from the cavernous fissures of Oreston. *Purchased*, 1872.

43699. The left scapho-lunar: from the cavernous fissures of Oreston. *Purchased*, 1872.

M. 103. The left scapho-lunar; from Cat's-Hole Cave, Gower, Glamorganshire. *Presented by Gen. Wood*, 1865.

M. 195. The associated second and third left metacarpals; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

M. 196. The associated second and third left metacarpals; from the Gailenreuth Cave. These bones are longer and more slender than No. M. 195.
Egerton Collection. *Purchased*, 1882.

M. 179. The associated fourth and fifth left metacarpals; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

M. 194. The associated fourth and fifth right metacarpals; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

M. 194 a. The second right metacarpal; from the Gailenreuth Cave. *Enniskillen Collection.* *Purchased*, 1882.

M. 197. The second right metacarpal; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

M. 369 b. The third left metacarpal; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

M. 369 a. The fifth right metacarpal; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

M. 369. Three specimens of the second metacarpal; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

43688. Two specimens of the proximal half of the left fifth metacarpal; from the cavernous fissures of Oreston.
Purchased, 1872.

43689. The proximal half of the right third metacarpal; from the cavernous fissures of Oreston; the articular surface imperfect. *Purchased*, 1872.

43690. Three specimens of phalangeals of the proximal row; from the cavernous fissures of Oreston. *Purchased*, 1872.

M. 204. Two specimens of phalangeals of the proximal row; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

M. 280. Two specimens of phalangeals of the proximal row; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

43691. A phalangeal of the middle row; from the cavernous fissures of Oreston. *Purchased*, 1872.

M. 281. Two specimens of the second phalangeal of the fourth digit of the right manus; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

M. 205. The second phalangeal of the third digit of the right manus; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 275. Ungual phalangeal; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

M. 206. Three specimens of the ungual phalangeal; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

48684–5. (*Fig.*) Two phalangeals of the proximal row; from Brixham Cave. These specimens are figured by Busk in the Phil. Trans. for 1873, pl. xlv. figs. 7, 8. *Brixham-Cave Collection. Presented*, 1876.

23733. (*Fig.*) The left innominate bone, wanting the greater part of the pubis; from the Pleistocene of Slade Green, near Erith, Kent. This specimen is described and figured ($\frac{2}{3}$) by Dawkins and Sanford in their 'Monograph of the British Pleistocene Mammalia' (Palæontographical Society, 1866), p. 10, pl. iii. fig. 1. *Purchased*, 1849.

M. 188. Acetabulum and ischiatic portion of the left innominate bone; from the Gailenreuth Cave. This specimen is of considerably smaller size than the last. *Enniskillen Collection. Purchased*, 1882.

M. 270. (*Fig.*) The right femur; from the Gailenreuth Cave. This specimen is figured in plate xviii. fig. 4 of Dawkins and Sanford's 'Monograph of the British Pleistocene Mammalia.' *Egerton Collection. Purchased*, 1882.

M. 189. The proximal half of the left femur; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 190. The distal half of the left femur, from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

40642. The greater portion of the left femur, wanting a portion of the head, the great trochanter, and the distal articular

extremity; from the Pleistocene gravels of Barnwell, Cambridge. This specimen, although of smaller size, agrees so closely with No. M. 270 that it may be safely referred to the same species. *Purchased*, 1867.

M. 191. The right tibia, wanting the greater part of the cnemial crest, the proximal articular surface, and the inner malleolus; from the Gailenreuth Cave. This specimen belonged to a small individual.
Enniskillen Collection. *Purchased*, 1882.

43692. The distal extremity of the left tibia; from the cavernous fissures of Oreston. This specimen is of very large size.
Purchased, 1872.

43694. The right astragalus, associated with the last specimen.
Purchased, 1872.

M. 193. A broken left astragalus; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

M. 277. The right astragalus, of very large size; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

43693. A broken right astragalus; from the cavernous fissures of Oreston. *Purchased*, 1872.

M. 276. A left astragalus; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

M. 277. A right astragalus; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

M. 192. A left calcaneum; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

43695. The articular portion of the left calcaneum; from the cavernous fissures of Oreston. *Purchased*, 1876.

43696. The cuboid; from the cavernous fissures of Oreston.
Purchased, 1876.

43697. The right navicular; from the cavernous fissures of Oreston.
Purchased, 1876.

M. 203. The right ecto-cuneiform; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

M. 198. The associated second, third, and fourth metatarsals of the

right side; from the Gailenreuth Cave; associated with No. M. 203. *Enniskillen Collection. Purchased*, 1882.

M. 273. The associated first, second, third, and fourth metatarsals of the left side; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

51 (O. C.). The second right metatarsal of a small individual; from Kirkdale Cave, Yorkshire.
Presented by W. Salmond, Esq. Before 1836.

M. 201. Two specimens of the second left metatarsal; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 370. The second left metatarsal; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

M. 202. The third left metatarsal; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 199. Two specimens of the fourth right metatarsal; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 370. The fourth right metatarsal; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

40368. The proximal extremity of the fourth right metatarsal; from Kirkdale Cave. *Purchased*, 1867.

M. 200. Two specimens of the fifth left metatarsal; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 370. The fifth left metatarsal; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

M. 182. The atlas vertebra, imperfect on the left side; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 18. A cervical vertebra; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 184. A dorsal vertebra; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 274. Two broken specimens of lumbar vertebræ; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

M. 185. A lumbar vertebra, with the processes broken and the

neural canal coated with stalagmite; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 208. Three caudal vertebræ; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 208 a. Three caudal vertebræ; from the Gailenreuth cave. *Egerton Collection. Purchased*, 1882.

Felis cristata, Falconer and Cautley[1].

Syn. *Uncia cristata*, Cope.
Uncia grandicristata, Cope.
Felis grandicristata, Bose[2].
(?) *Felis palæotigris*, Falc. (MSS.).

Hab. India.

28913. Cast of the cranium. The original specimen, which is the type, is from the Pliocene of the Siwalik Hills, India, and is preserved in the Museum of the Royal College of Surgeons (No. 358); it is figured and described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 320, pls. xli. and xlii. The original was presented to the College of Surgeons by Walter Ewer, Esq.
Presented by the Directors of the East-India Company, 1854.

49176. (*Fig.*) Hinder portion of the cranium; from the Pliocene of the Siwalik Hills. This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 323–4, pl. xl. fig. 1.
Cautley Collection. Presented, 1842.

49175. (*Fig.*) Hinder portion of the cranium of a very large individual. This specimen is described by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 127, under the name of *F. grandicristata*; but is figured and referred by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 324, pl. xl. fig. 2, to the present species.
Cautley Collection. Presented, 1842.

Felis (? Cynælurus) brachygnatha, Lydekker[3].

Hab. India.

16537. (*Fig.*) Greater portion of the right ramus of the mandible, wanting the canine; from the Pliocene of the Siwalik Hills, India.

[1] Asiatic Researches, vol. xix. p. 135 (1836).
[2] Quart. Journ. Geol. Soc. vol. xxxvi. p. 127 (1880).
[3] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 326 (1884).

This specimen (which with the next forms the type of the species) is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 326, pl. xliii. figs. 2, 2*a*. *Cautley Collection. Presented*, 1842.

16573. The greater portion of the right ramus of the mandible of (*Fig.*) an immature individual; from the Pliocene of the Siwalik Hills. This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pl. xliii. figs. 1, 1*a*. *Cautley Collection. Presented*, 1842.

Felis prisca, Kaup[1].

Hab. Germany.

M. 1575. A cast of the right upper carnassial tooth; from the Upper Miocene of Eppelsheim, Hesse-Darmstadt. The original, which is preserved in the Museum at Darmstadt, is the type of the species, and is described and figured by Kaup in the 'Ossemens Fossiles du Muséum de Darmstadt,' pt. ii. p. 20, pl. ii. fig. 2. *Purchased.*

Felis pardus, Linn.[2]

Hab. Southern Asia and Africa (Recent), and Europe (Pleistocene).

47704. Fragment of the left maxilla and premaxilla, containing the (*Fig.*) broken canine, the alveolus of pm. 2, and the complete pm. 3: from the Genista Cave, Gibraltar. This specimen is described and figured by Busk in the Trans. Zool. Soc. vol. x. pl. iii. fig. 2, p. 79 (1877).

Brome Collection. Presented, 1876.

47693. The mandible, wanting the hinder half of the left, and the (*Fig.*) condylar and angular portions of the right ramus; from the Genista Cave. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. iii. fig. 1.

Brome Collection. Presented, 1876.

47695. Fragment of the right ramus of the mandible of a young individual; from the Genista Cave.

Brome Collection. Presented, 1876.

27659. The left lower carnassial of a *Felis* of the size of the present species; from a cave near Montpellier. This tooth is apparently indistinguishable from the corresponding tooth of the present species; it is, however, possible that it may

[1] Oss. Foss. de Darmstadt, pt. ii. p. 20 (1833).

[2] Syst. Nat. ed. 12, vol. i. p. 61 (1766).

belong to some of the other species described by Bourguignat[1] from the French Pleistocene.

Bravard Collection. *Purchased*, 1852.

47705. Two specimens of the proximal extremity of the ulna of opposite sides; from the Genista Cave.

Brome Collection. *Purchased*, 1876.

47703. The distal extremity of the left tibia; from a cavern at Windmill Hill, Gibraltar. *Brome Collection.* *Purchased*, 1876.

M. 373. The left lower carnassial of a large *Felis* which may belong to the present species; from the Pleistocene (?) of the Val d'Arno. *Egerton Collection.* *Purchased*, 1882.

Felis (sp.; allied to *F. pardus*).

Hab. India.

16537 a. (*Fig.*) Fragment of the left ramus of the mandible, showing the three cheek-teeth; from the Pliocene of the Siwalik Hills, India. This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 328, pl. xliii. figs. 4, 4*a*.

Cautley Collection. *Presented*, 1842.

48929. Fragment of the left ramus of the mandible, containing the two last cheek-teeth; from the Pliocene of the Siwalik Hills. This specimen is mentioned by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 329, where it is referred to the same species as the last. It is, however, possible that it may belong to *F. brachygnatha*.

Cautley Collection. *Presented*, 1842.

Felis onca, Linn.[2]

Syn. (?) *Felis affinis onca*, Lund[3].

Hab. America.

18892. Fragment of the right ramus of the mandible, containing $\overline{\text{pm. 3}}$, and $\overline{\text{m. 1}}$ in an almost unworn condition, and the broken base of $\overline{\text{pm. 4}}$; from a cavern in Minas Geraes, Brazil. This specimen is indistinguishable from the mandible of large individuals of the Jaguar. H. Gervais and Ameghino (*loc. cit.*) record this species from the Pleistocene

[1] Histoire des Felidæ fossiles constatés en France, etc. (1879).

[2] Syst. Nat. ed. 12, vol. i. p. 61 (1766).

[3] *Vide* H. Gervais and Ameghino, 'Les Mammifères fossiles de l'Amérique du Sud,' p. 17 (1880).

of Buenos Ayres; and it seems highly probable that the so-called *F. affinis onca*, Lund, should be referred to the same species. *Claussen Collection. Purchased*, 1845.

37684. The fourth right metatarsal, probably belonging to the present species; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

Felis pardalis, Linn.[1]

Syn. (?) *Felis affinis pardalis*, Lund[2].

Hab. America.

18877. Three specimens of the humerus of a *Felis*, agreeing precisely with the corresponding bone of the Ocelot; from a cavern in Minas Geraes, Brazil. This species is not recorded by H. Gervais and Ameghino from the S. American Pleistocene; but it is probable that Lund's *F. affinis pardalis* is really the same. *Claussen Collection. Purchased*, 1845.

Felis pardina (Oken[3]).

Syn. *Lynx pardalis*, Oken.

Hab. Spain.

47690. (*Fig.*) Fragment of the anterior portion of the cranium, showing the complete dentition; from the Genista Cave, Gibraltar. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. iii. fig. 3. The second premolar is absent. *Brome Collection. Presented*, 1876.

47691. (*Fig.*) The nearly complete mandible, wanting a large portion of the right ramus; from the Genista Cave. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. iii. fig. 4. *Brome Collection. Presented*, 1876.

47694. Fragment of the right maxilla, with the teeth broken; from the Genista Cave. The second premolar is absent. *Brome Collection. Presented*, 1876.

47699. Distal portion of the left humerus; from the Genista Cave. *Brome Collection. Presented*, 1876.

47700. Proximal extremity of the left ulna; from the Genista Cave. *Brome Collection. Presented*, 1876.

[1] Syst. Nat. ed. 12, vol. i. p. 62 (1766).

[2] *Vide* H. Gervais and Ameghino, *op. cit.* p. 15.

[3] In Temminck's 'Monographie de Mammalogie,' p. 116 (1827).

Felis caffra, Desmarest [1].

Syn. *Felis caligata*, Temm.[2]
Felis maniculata, Rüppell [3].

Hab. Africa and S. Asia (Recent), and Europe (Pleistocene).

47696. (*Fig.*) The left ramus of the mandible, from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. iii. fig. 6 (1877), under the name of *F. caligata*. *Brome Collection. Presented*, 1876.

47697. The hinder portion of the left ramus of the mandible, showing the carnassial tooth; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

46798. The right humerus; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

47701. The distal extremity of the left humerus; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

47702. The proximal extremity of the left radius; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

47706. The left tibia; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

47707. The fourth and fifth left metatarsals; from a cavern in Windmill Hill. *Brome Collection. Presented*, 1876.

Felis brevirostris, Croizet and Jobert [4].

Syn. *F. leptorhyncha*, P. Gervais [5] (*ex* Bravard).

Hab. France.

29622. Cast of the cranium. The original is from the Upper Pliocene of Mont Perrier, near Issoire (Puy-de-Dôme), France; and is figured by P. Gervais, under the name of *F. leptorhyncha*, in the Zool. et Pal. Françaises, 2nd ed. pl. xxvii. fig. 3. The second premolar is absent. *Hastings Collection. Purchased*, 1855.

29623. Cast of the mandible. The original is from the Upper

[1] Mammalogie, Suppl. p. 540 (1822).
[2] Monographie de Mammalogie, vol. i. p. 123 (1827).
[3] In Temminck, *op. cit.* p. 128.
[4] Oss. Foss. du Puy-de-Dôme, vol. i. p. 200 (1828).
[5] Zool. et Pal. Françaises, 1st. ed. pl. xxvii. (1848–52).

Pliocene of Mt. Perrier; and is figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxvii. fig. 4.
Hastings Collection. *Purchased*, 1855.

28864. The greater portion of the left ramus of the mandible, showing the canine and the three cheek-teeth; from the Upper Pliocene of Puy-de-Dôme.
Bravard Collection. *Purchased*, 1852.

28865. The right humerus; from the Upper Pliocene of Puy-de-Dôme. *Bravard Collection.* *Purchased*, 1852.

28866. The right ulna; associated with No. 28865.

28867. The right radius; associated with No. 28865.

27651. (*Fig.*) The distal extremity of the left humerus; from the Upper Pliocene of Mont Perrier. This specimen is figured by Croizet and Jobert in the 'Oss. Foss. du Puy-de-Dôme,' vol. i. pl. vi. fig. 6. *Croizet Collection.* *Purchased*, 1848.

27658. (*Fig.*) The proximal extremity of the radius; from the Upper Pliocene of Mont Perrier. This specimen is figured by Croizet and Jobert, *op. cit.* fig. 9.
Croizet Collection. *Purchased*, 1848.

28868. The left femur; from the Upper Pliocene of Mont Perrier.
Bravard Collection. *Purchased*, 1852.

Felis issiodorensis, Croizet and Jobert [1].

Hab. France.

27614. (*Fig.*) Fragment of the left ramus of the mandible, containing the carnassial; from the Upper Pliocene of Mont Perrier. This specimen is figured by Croizet and Jobert in the 'Oss. Foss. du Puy-de-Dôme,' vol. i. pl. iv. fig. 4.
Croizet Collection. *Purchased*, 1848.

28860. The nearly complete left ramus of the mandible; from the Pliocene of Puy-de-Dôme.
Bravard Collection. *Purchased*, 1852.

28861. The left ulna; from the Pliocene of Puy-de-Dôme.
Bravard Collection. *Purchased*, 1852.

Felis ogygia, Kaup [2].

M. 1574. Cast of the symphysial extremity of the left ramus of the

[1] Oss. Foss. du Puy-de-Dôme, vol. i. p. 198 (1828).
[2] Oss. Foss. de Darmstadt, pt. ii. p. 21 (1833).

mandible. The original of this specimen was obtained from the Upper Miocene of Eppelsheim, Hesse Darmstadt; and is figured by Kaup in the 'Oss. Foss. de Darmstadt,' pt. ii. pl. ii. fig. 3, and by De Blainville in the 'Ostéographie,' genus *Felis*, pl. xvi. *Purchased.*

Felis catus (Linn.)[1].

Hab. Europe.

16710. (*Fig.*) The left ramus of the mandible, from Kent's-Hole Cavern, Torquay. This specimen is mentioned in Owen's 'British Fossil Mammals and Birds,' p. 173, and the teeth are figured in outline in the figure on p. 172.
McEnery Collection. Purchased, 1842.

M. 95. The left ramus of the mandible, containing the carnassial; from Cat's-Hole Cavern, Gower, Glamorganshire.
Presented by Gen. Wood, 1865.

M. 96. The left ramus of the mandible, containing the canine and the three cheek-teeth; from Cat's-Hole Cavern.
Presented by Gen. Wood, 1865.

Genus **PSEUDÆLURUS**, Gervais[2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$ Pm. $\frac{3}{(3-4)}$, M. $\frac{1}{(1-2)}$. The inner cusp of the lower carnassial is absent in the typical forms, but is present in *P. intermedius*[3].

Pseudælurus intermedius, Filhol[4].

Hab. France.

M. 1367. Two portions of the opposite rami of the mandible, one showing the two last premolars and the carnassial, and the other the last premolar and the carnassial (broken), and both showing the alveolus of a small $\overline{\text{m. 2}}$; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. These specimens are similar to the type specimen figured by Filhol[5], with the exception of the presence of $\overline{\text{m. 2}}$. In the presence of a minute inner cusp to $\overline{\text{m. 1}}$ this species forms

[1] Syst. Nat. ed. 12, vol. i. p. 62 (1766).
[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 127 (1848–52).
[3] In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 314, it is stated that this cusp is invariably absent.
[4] Ann. Sci. Géol. vol. vii. art. 7, p. 167 (1876).
[5] *Ibid.* pl. xxv. figs. 128–9.

an almost complete transition from more typical species of the genus to the viverrine *Palæoprionodon*.

Purchased, 1884.

Genus **PROÆLURUS**, Filhol [1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$. This genus is doubtfully placed in the present family; it seems to connect *Pseudælurus* with the viverrine *Palæoprionodon*, and also exhibits affinity with the *Mustelidæ*. There is a talon and a small inner cusp to the lower carnassial. The first lobe of pm. 4 is rudimentary or wanting.

Proælurus lemanensis, Filhol [2].

Hab. France.

M. 1645. Hinder portion of the left ramus of the mandible, showing the third and fourth premolars, the carnassial (broken), and the alveolus of the minute m. 2; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees precisely with the mandibles figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xxvi. figs. 7–10.

Purchased, 1884.

M. 1646. Two specimens of the right maxilla of a Carnivore, probably belonging to the present species; from the Upper Eocene of Bach. The more perfect specimen contains the third premolar and the carnassial, and the alveoli of pm. 2 and m. 1, behind which there was no other tooth. The carnassial is musteline, having a rudimentary anterior lobe, and the third premolar is feline. The teeth agree so exactly in size and general character with those of the mandible, that there is every probability that the maxilla belongs to the same species. The length of the upper carnassial is 0,014. *Purchased*, 1884.

Genus **ÆLUROGALE**, Filhol [3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{(3-4)}$, M. $\frac{1}{(1-2)}$.

[1] Ann. Sci. Géol. vol. x. art. 3, p. 192 (1879), *Proailurus*. *Ibid.*

[3] *Ibid.* vol. iii. art. 7, p. 14 (1872).

Ælurogale sivalensis, Lydekker[1].

Syn. *Pseudælurus sivalensis*, Lydekker [2].

Hab. India.

M. 1560. Cast of the greater portion of the right ramus of the mandible, showing the broken base of the canine, the alveoli of the three premolars, and the broken carnassial. The original of this specimen, which is the type of the species, is preserved in the Indian Museum, Calcutta, and was obtained from the Siwaliks of the Punjab. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 317, pl. xliv. figs. 7, 7*a*.

Purchased, 1884.

Genus **ÆLUROPSIS,** Lydekker [3].

Dentition :—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. (?), M. $\frac{?}{2}$.

Æluropsis annectans, Lydekker[4].

Hab. India.

M. 1559. Cast of the hinder portion of the right ramus of the mandible, containing the last premolar, the broken carnassial, and the aveolus of $\overline{\text{m. 2}}$. The original of this specimen, which is the type of the genus and species, is preserved in the Indian Museum, Calcutta, and was obtained from the Siwaliks of the Punjab. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 316, pl. xxxiii. figs. 4, 4*a*.

Purchased, 1884.

Limb-bones of undetermined Felines.

a. *From the Pliocene of the Siwalik Hills, India.*

37144. The centrum of the axis vertebra of a large species of *Felis* or *Machærodus*. *Cautley Collection. Presented*, 1842.

37146. The distal extremity of the right humerus of a large species. (*Fig.*). This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii.

[1] Rec. Geol. Surv. Ind. vol. x. p. 83 (1877), *Pseudælurus*.
[2] *Loc. cit.*
[3] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 316 (1884).
[4] *Loc. cit.*

pp. 345–6, pl. xliii. fig. 11, where it is suggested that it may belong to *Felis cristata*.

Cautley Collection. Presented, 1842.

37142. The distal extremity of the left humerus, of still larger size than the last specimen. This specimen is alluded to by the present writer in the passage quoted above.

Cautley Collection. Presented, 1842.

37156. Fragment of the left carpus and metacarpus of a species about the size of *F. pardus*, showing several of the carpal bones, and the proximal extremities of the third, fourth, and fifth metacarpals.

Cautley Collection. Presented, 1842.

40827. Distal extremity of the left femur of a very large species, which is probably either *Felis cristata* or *Machœrodus palœindicus*. The dimensions of this specimen are given by the present writer [1] in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 347. *Cautley Collection. Presented*, 1842.

40827 a. The distal extremity of the right femur, of smaller size than the last. *Cautley Collection. Presented*, 1842.

40827 b. The distal extremity of the left femur, of the same size as the last. *Cautley Collection. Presented*, 1842.

37145. The proximal extremity of a right tibia, of about the same size as *Felis pardus*. *Cautley Collection. Presented*, 1842.

M. 1566. The distal half of a right tibia, of about the same size as the corresponding bone of a small Tiger.

Cautley Collection. Presented, 1842.

15135. The left astragalus of a species about the size of a large Leopard. *Cautley Collection. Presented*, 1842.

16565. The distal elements of the left tarsus, with the proximal halves of the five metatarsals, belonging to a species about the size of *Felis pardus*. This specimen not improbably belongs to the same individual as No. 37156.

Cautley Collection. Presented, 1842.

[1] The number is erroneously given as 40527.

b. *From the Pleistocene of Buenos Ayres.*

37682. The distal extremity of the left humerus of a feline Carnivore about the size of a Leopard, exhibiting a large ent e-picondylar foramen. This bone belonged to an adult animal, and is far too small for *Machœrodus neogœus.*
Bravard Collection. Purchased, 1854.

c. *From the Pleistocene of the Narbada Valley, India.*

15924. Distal extremity of the right femur of a species of the size of a large Tiger. *Presented by C. Fraser, Esq.*

15922. Distal extremity of the left femur, of rather smaller size than the last specimen; collected at the village of Naogaon in 1839. *No history.*

d. *From the Pleistocene of England.*

M. 1625. Portion of the humerus (apparently) of a large feline; from the Forest-bed of Kessingland, Norfolk. This specimen is noticed by Newton in the Mem. Geol. Surv. England and Wales, "Vertebrata of Forest-bed Series of Norfolk and Suffolk," p. 23 (1882).
Presented by Miss L. Martineau, 1884.

Family HYÆNIDÆ.

In many respects the typical genus is more intimately allied to *Canis* (notably in the structure of the feet and the absence of an entepicondylar foramen to the humerus) than to the preceding family; and as some of the *Viverridæ* are extremely close to the *Felidæ*, the former family is very frequently placed next to the latter. The relationship of *Cynodictis* to the *Viverridæ* is, however, so extremely intimate that it seems imperative to place the Canoids and Viverroids in juxtaposition. The dentition of some of the most specialized species of *Hyœna* is moreover extremely feline, while some of the more generalized forms (*Lepthyœna*) are very like those of some of the primitive felines, so that there are strong indications of affinity between the two families. On the other hand, the more generalized species of *Hyœna* (*H. macrostoma*) exhibit very strongly marked affinities to the Canoids, while the genus *Ictitherium* closely connects other species (*H. sivalensis*) with the Viverroids; so that the impossibility of exhibiting the full affinities of a group by any lineal system of classification is very strongly exemplified.

Genus **HYÆNA**, Zimm.[1]

Syn. *Crocotta*, Kaup.
Crocuta, Gray.
Euhyæna, Falconer.
Hyænictis, Gaudry[2].
Lycyæna, Hensel[3].

Dentition.—The normal adult dental formula of *Hyæna*, in which, for palæontological purposes, at all events, *Crocuta* is best included, is I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{1}{1}$. In certain fossil forms, however, pm. 1 is, either occasionally or normally, absent, while in others $\overline{\text{pm. 1}}$ is normally developed; and in others again $\overline{\text{m. 2}}$ may be present. The range of variation in the dentition may therefore be expressed by the following formula:—viz. I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{(3-4)}$, M. $\frac{1}{(1-2)}$. It is, however, not improbable that the upper true molar may be entirely wanting in some instances.

Hyæna crocuta (Erxleben[4]).

Syn. *Hyæna capensis*, Desmarest.
Hyæna maculata, Zimmermann.
Hyæna rufa, Cuvier.
Hyæna spelæa, Goldfuss[5] (? var.).
Crocotta maculata, Kaup.
Crocotta spelæa, Kaup (? var.).
Crocuta maculata, Gray.
Canis crocuta, Erxleben[6].

In this species m. 1 has a small talon and no inner cusp; m. 1 is always minute, and may possibly be absent in some instances; it has either one or two fangs. In one skull[7] there is on one side the alveolus of a minute $\overline{\text{m. 2}}$. The hinder lobe of pm. 4 is larger than the middle; and there is no distinct anterior talon to pm. 3, which is set parallel to the molar alveoli.

Hab. Africa (Recent), and Europe (Pleistocene).

[1] Specimen Zoologicæ Geographicæ, p. 365 (1777). The genus also has the pre-Linnean authority of Brisson, under which it is frequently quoted.

[2] Comptes Rendus, vol. lii. p. 722 (1861). The reasons for including this genus in *Hyæna* are given under the head of *H. sivalensis*.

[3] Monatsb. k. preuss. Ak. Wiss. 1862 (vol. for 1863), p. 567. The reasons for including this genus in *Hyæna* are given under the head of *H. macrostoma*.

[4] Syst. Reg. Animal. p. 578 (1777), *Canis crocuta*.

[5] Nova Acta Ac. Cæs. Leop.-Car. vol. xi. pt. 2, p. 456 (1823).

[6] *Loc. cit.*

[7] This specimen is in the Museum of the Royal College of Surgeons (No. 523).

28557. The nearly complete cranium, wanting the left zygomatic region, the incisors, the right canine, and the second left premolar; from a cavern in Sundwig, Westphalia. This specimen belonged to an extremely aged individual, the teeth being very much worn; there is no sign of the presence of m. 1. *Purchased*, 1853.

29 (O. C.). (*Fig.*) Cranium, wanting the zygomatic, nasal, and premaxillary regions; from a cavern in Muggendorf, Franconia. This specimen exhibits a severe lesion in the parietal region, which had, however, healed before the death of the animal. It has been described and figured by Sömmering in 'Nova Acta Ac. Cæs. Leop.-Car.' vol. xiv. p. 1, pls. 1, 2; by Cuvier in the 'Ossemens Fossiles,' ed. 1822, vol. iv. p. 399, pl. xx. figs. 6, 7; and by Owen in the 'British Fossil Mammals and Birds,' pp. 153–4, fig. 59. The teeth are well worn, the greater portion of pm. 4 being broken away; there is no trace of m. 1. The condition of the bone is remarkably fresh, there being no adhesion to the tongue in any part.

Sömmering Collection. Purchased, 1827.

14274. The right maxilla, showing the whole of the teeth in an almost unworn and very perfect condition; from Kent's-Hole Cavern, Torquay. There is a minute alveolus for m. 1.

McEnery Collection. Purchased, 1842.

16693. A portion of the left maxilla, showing the three last premolars; from Kent's-Hole Cavern. There is no trace of m. 1. *McEnery Collection. Purchased*, 1842.

37162. A portion of the left maxilla, showing the three last premolars; from Brixham Cave, near Torquay. The teeth are well worn, and there is no trace of m. 1.

Presented by R. W. Wolston, Esq., 1863.

32 (O. C.). Damaged occipital portion of a cranium; from Kirkdale Cave, Yorkshire.

Presented by W. Salmond, Esq. Before 1836.

27959. The hinder half of the cranium; from Westeregeln, near Magdeburg. *Presented by J. Brown, Esq.*, 1852.

37165. The hinder portion of the cranium; from Brixham Cave.

Presented by R. W. Wolston, Esq., 1863.

37166. A fragment of the parietal portion of the cranium; from Brixham Cave. *Presented by R. W. Wolston, Esq.*, 1863.

28582. Basis of the cranium; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

30 x (O. C.). Fragment of right maxilla, containing the last three premolars; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

42927. Fragment of the right maxilla, containing the unworn pm. 3 and the alveoli of the other teeth; from the Grotto de Remouchamps. *Purchased*, 1853.

44748. Fragment of the left maxilla, containing pm. 3 and pm. 4 and the alveolus of m. 1; from a cavern at Bleadon. The teeth are little worn and of very large size.
Presented by B. Bright, Esq., 1873.

44750. Fragment of the upper canine tooth; from a cavern at Bleadon. *Presented by B. Bright, Esq.*, 1873.

18982. The greater portion of the left maxilla and premaxilla; from Kent's-Hole Cavern. All the teeth are present with the exception of pm. 1 and m. 1, of both of which the alveoli are visible. *Presented by Rev. Upton Richards*, 1845.

16695. The greater portion of the right maxilla; from Kent's-Hole Cavern. The canine is broken; the four premolars are present, in a well-worn condition; but there is no trace of m. 1. *McEnery Collection. Purchased*, 1842.

37163. Fragment of the left maxilla, containing pm. 3 and pm. 4; from Kent's-Hole Cavern. The teeth are little worn, and there is a minute alveolus for m. 1.
Presented by R. W. Wolston, Esq., 1863.

18273. Fragment of the left maxilla of a very old individual, containing the alveolus of pm. 2, the complete pm. 3, and a part of pm. 4; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

18982. Fragment of the left maxilla, containing the three last cheek-teeth in an early stage of wear; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

35 (O. C.). The right premaxilla, containing the three incisors; from Kirkdale Cave.

Presented by W. Salmond, Esq. Before 1836.

48708. Part of the left maxilla, containing the second and third premolars and the canine; from Brixham Cave.

Brixham-Cave Collection. Presented, 1876.

M. 1340. Casts of the associated canine, and second, third, and fourth upper premolars; from the Forest-bed Series of Corton Cliff, Suffolk. The originals of these specimens are in the possession of J. J. Colman, Esq., and are described and figured by Newton in the 'Geological Magazine' for 1883, pp. 433–5, pl. x.

Presented by E. T. Newton, Esq., 1884.

47708. (*Fig.*) Palate; from the Genista Cave, Gibraltar. This specimen is described and figured by Busk in the Trans. Zool. Soc. vol. x. p. 75, pl. ii. figs. 1, 2, 3. It shows the first three premolars, in a well-worn condition, and the broken carnassial of the right side.

Brome Collection. Presented, 1876.

47709. (*Fig.*) The occipital portion of the same cranium as the last; from the Genista Cave, Gibraltar. This specimen is described and figured by Busk in the Trans. Zool. Soc. vol. x. p. 75, pl. ii. fig. 4. *Brome Collection. Presented*, 1876.

M. 91. The right maxilla, containing the canine and the first three premolars, in a much-worn condition; from Cat's-Hole Cave, Gower, Glamorganshire.

Presented by Gen. Wood, 1865.

M. 1573. (*Fig.*) The right ramus of the mandible, wanting the incisors and the last premolar; from the Gailenreuth Cave. This specimen is figured by Cuvier in the 1836 edition of the 'Ossemens Fossiles,' pl. cxcii. fig. 9; it belonged to an animal of medium age.

Sömmering Collection. Purchased, 1827.

17988. The greater portion of the right ramus of the mandible of an immature individual; from Kent's-Hole Cavern.

McEnery Collection. Purchased, 1842.

14174. The greater portion of the right ramus of the mandible, showing all the teeth except the third incisor; from Kent's-Hole Cavern. The true molar is much worn.

No history.

28559. The nearly complete right ramus of the mandible, wanting the incisors and canine; from a cavern in Sundwig, Westphalia. The teeth are well worn, and indicate an old animal. *Purchased*, 1853.

18982 a. The horizontal part of the right ramus of the mandible, wanting the symphysis; from Kent's-Hole Cavern. All the cheek-teeth are present, and are but slightly worn. *Presented by Rev. Upton Richards*, 1845.

14172. The anterior portion of the mandible of an immature individual; from Kent's-Hole Cavern. This specimen lacks the incisors, but shows all the other teeth in beautiful preservation. *No history.*

28560. The greater portion of the right ramus of the mandible, containing the last three cheek-teeth; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28560 a. The horizontal portion of the left ramus of the mandible, showing all the teeth except the incisors, in a well-worn condition; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28560 b. The greater portion of the right ramus of the mandible of an immature individual, showing the partially protruded canine, the third and fourth premolars, and the alveoli of $\overline{\text{pm. 2}}$ and $\overline{\text{m. 1}}$; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28015. (*Fig.*) The greater part of the horizontal portion of the right ramus of the mandible; from the Pleistocene "till" of Walton-on-the-Naze, Essex. This specimen is described and figured by Owen in the 'British Fossil Mammals and Birds,' p. 151, fig. 58. It shows the whole of the cheek-teeth in a much-worn condition, and the alveolus of the canine and one incisor. *Presented by J. Brown, Esq.*, 1852.

33 (O. C.). The greater portion of the left ramus of the mandible, showing all the teeth except the incisors; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

46135. The greater portion of the left ramus of the mandible of an old individual; dredged off the Dogger Bank. *Owles Collection. Purchased*, 1874.

37167. The anterior portion of the left ramus of the mandible, showing the canine and cheek-teeth; from Kent's-Hole Cavern. *Presented by R. W. Wolston, Esq.*, 1863.

37168. The middle portion of the left ramus of the mandible, showing the four cheek-teeth, in a very slightly worn condition; from Kent's-Hole Cavern.
Presented by R. W. Wolston, Esq., 1863.

37169. Fragment of the left ramus of the mandible, containing the second and third premolars; from Kent's-Hole Cavern.
Presented by R. W. Wolston, Esq., 1863.

37170. Fragment of the left ramus of the mandible of a young individual, showing the canine and $\overline{\text{pm. 3}}$; from Kent's-Hole Cavern. *Presented by R. W. Wolston, Esq.*, 1863.

37171. Fragment of the left ramus of the mandible of a young individual, showing the third premolar; from Kent's-Hole Cavern. *Presented by R. W. Wolston, Esq.*, 1863.

22028. Fragment of the left ramus of the mandible, containing the canine, $\overline{\text{pm. 3}}$, and $\overline{\text{pm. 4}}$, with the associated carnassial of the opposite side; from the Pleistocene of Grays, Essex.
Purchased, 1848.

48698. Fragment of the left ramus of the mandible, showing the two last premolars and the carnassial; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

15436. Anterior portion of the right ramus of the mandible, showing the canine and the three premolars; from Kent's-Hole Cavern. In this specimen $\overline{\text{pm. 3}}$ is double, there being one tooth in the regular line (which is much more worn than the teeth in front and behind), and a second tooth on the outer side of the regular line, which is in the same state of wear as the teeth in front and behind; the large size of the much-worn tooth proves that it cannot be a retained milk-molar.
McEnery Collection. Purchased, 1842.

17964. The left half of the symphysis of the mandible, containing two incisors, the canine, and $\overline{\text{pm. 2}}$; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

16700. The anterior extremity of the right ramus of the mandible,

containing the incisors, canine, and premolars; from Kent's-Hole Cavern.

McEnery Collection. *Purchased*, 1842.

M. 441. Fragment of the right ramus of the mandible, containing $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$; both in a much-worn condition. This specimen is marked "Kent's Hole?"; but its condition is not that of the bones from that place.

Enniskillen Collection. *Purchased*, 1882.

48721. (*Fig.*) Fragment of the left ramus of the mandible, containing the canine and the three premolars; from Brixham Cave. This specimen is figured by Busk in the Phil. Trans. 1873, pl. xlv. fig. 1.

Brixham-Cave Collection. *Presented*, 1876.

22038. An associated left lower $\overline{\text{pm. 4}}$ and the right upper $\underline{\text{pm. 3}}$; from the Pleistocene of Grays, Essex. *Purchased*, 1848.

50020. Eight specimens of teeth and fragments of the mandible; from Kent's-Hole Cavern.

Bequeathed by Sir Walter C. Trevelyan, 1879.

18982. Several fragments of upper and lower jaws; from Kent's-Hole Cavern. *Presented by Rev. Upton Richards*, 1845.

16694. Greater portion of the left ramus of the mandible, containing nearly all the teeth, in a well-worn condition; from Kent's-Hole Cavern. *McEnery Collection.* *Purchased*, 1842.

17987. Greater portion of the right ramus of the mandible, showing the four cheek-teeth and the canine; from Kent's-Hole Cavern. *McEnery Collection.* *Purchased*, 1842.

16706. Part of the left ramus of the mandible, containing the three last cheek-teeth; from Kent's-Hole Cavern.

McEnery Collection. *Purchased*, 1842.

32260. Fragment of the left ramus of the mandible, with the three unworn premolars; from Kent's-Hole Cavern.

McEnery Collection. *Purchased*, 1842.

17933. Fragment of the right ramus of the mandible of a young individual; from Kent's-Hole Cavern.

McEnery Collection. *Purchased*, 1842.

17932. Fragment of the right ramus of the mandible, containing the four cheek-teeth; from Kent's-Hole Cavern.

McEnery Collection. *Purchased*, 1842.

16702. Fragment of the left ramus of the mandible, showing the four cheek-teeth; from Kent's-Hole Cavern.
McEnery Collection. *Purchased*, 1842.

16701. The greater portion of the left ramus of the mandible, wanting $\overline{\text{pm. 3}}$; from Kent's-Hole Cavern.
McEnery Collection. *Purchased*, 1842.

33 a (O. C.). The condylar extremity of the left ramus of the mandible; from Kirkdale Cave.
Presented by W. Salmond, Esq. *Before* 1836.

32509. Fragment of the left ramus of the mandible, containing the last two teeth; from the osseous breccia of Vallieux (Loir-et-Cher), France. *Tesson Collection.* *Purchased*, 1857.

M. 92. Two specimens of the mandible, one very perfect and containing all the cheek-teeth; from Cat's-Hole Cave, Gower, Glamorganshire. *Presented by Gen. Wood*, 1865.

28560. The greater part of the left ramus of the mandible, containing all the cheek-teeth except the incisors; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

16696. The greater part of the left ramus of the mandible, containing the four cheek-teeth and the alveoli of the incisors and canines; from Kent's-Hole Cavern.
McEnery Collection. *Purchased*, 1842.

17989. The greater part of the left ramus of the mandible, containing the four cheek-teeth in an early stage of wear; from Kent's-Hole Cavern.
McEnery Collection. *Purchased*, 1842.

17437. The left ramus of the mandible, showing the milk-teeth, and the germs of the permanent teeth *in alveolo*; from Kent's-Hole Cavern. *McEnery Collection.* *Purchased*, 1842.

M. 440. Fragment of the left ramus of the mandible, showing the germs of the permanent cheek-teeth; from Kent's-Hole Cavern. *Enniskillen Collection.* *Purchased*, 1882.

36 (O. C.). A fragment of the right maxilla, and the left ramus of the mandible, containing the milk-teeth and the germs of those of the permanent series; from Kirkdale Cave.
Presented by W. Salmond, Esq. *Before* 1836.

17909. Fragment of the left ramus of the mandible of a young

individual, with the second and third milk-molars; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

37164. Fragment of the right maxilla of a very young individual, showing the three milk-teeth in an unworn condition; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

37 (O. C.). The glenoidal extremity of the left scapula; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

40 (O. C.). The distal two-thirds of the left humerus; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

37181. The right humerus, wanting the proximal extremity; from Brixham Cave. *Presented by R. W. Wolston, Esq.*, 1863.

41 (O. C.). The right radius, wanting the distal extremity; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

37180. The right radius, wanting the distal extremity; from Brixham Cave. *Presented by R. W. Wolston, Esq.*, 1863.

42 (O. C.). The right ulna, wanting the distal extremity and the summit of the olecranon; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

37181 a. The right ulna, wanting the distal extremity and the greater portion of the olecranon; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

48 (O. C.). The pisiform; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

44 (O. C.). The second left metacarpal; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

16758. The third right metacarpal; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

16758 a. The fifth left metacarpal; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

44 a (O. C.). The fifth left metacarpal; from Kirkdale Cave. This bone is of a much stouter type than the last.
Presented by W. Salmond, Esq. Before 1836.

39 a (O. C.). The iliac and acetabular portion of the left innominate; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

39 (O. C.). The proximal half of the right femur, wanting the great trochanter; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

19843. The right femur, wanting the distal extremity; from the Pleistocene of Grays, Essex. *Purchased,* 1845.

37184. The left tibia; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

37185. The distal portion of the right tibia; from Kent's-Hole Cavern. *McEnery Collection. Purchased,* 1842.

43 (O. C.). The distal extremity of the right tibia; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

49 (O. C.). The left calcaneum; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

45 (O. C.). The left astragalus; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

18278. The left astragalus; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

47 (O. C.). The right navicular; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

16783. The distal portion of a metatarsal; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

37197. A second phalangeal; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

38 (O. C.). The atlas vertebra, wanting the alæ; from Kirkdale Cave. *Presented by W. Salmond, Esq. Before* 1836.

37176. The atlas vertebra, wanting the alæ; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

48709. The atlas vertebra, nearly perfect; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

37175. The atlas vertebra, wanting the alæ; from Kent's-Hole Cavern. *McEnery Collection. Purchased,* 1842.

37177. The axis vertebra; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

38 (O. C.). The axis vertebra, much broken; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

58719. The fourth cervical vertebra; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

38 b (O. C.). The fourth cervical vertebra; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

38 (O. C.). The fifth cervical vertebra; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

38 c (O. C.). The sixth cervical vertebra; from Kirkdale Cave.
Presented by W. Salmond, Esq. Before 1836.

48722. The seventh cervical vertebra; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

37178. A late cervical vertebra; from Kent's-Hole Cavern.
McEnery Collection. Purchased, 1842.

Hyæna perrieri, Croizet and Jobert[1].

In this form the lower carnassial has a large talon, but no inner tubercle; the upper true molar is of medium size. It is probable that it is closely related to *H. crocuta*, of which it has been considered merely a variety.

Hab. Europe.

27654. (*Fig.*) The germ of the left lower carnassial tooth; from the Upper Pliocene of Mt. Perrier, near Issoire, (Puy-de-Dôme), France. This tooth is about the size of the corresponding tooth of a small individual of *H. crocuta*, but has a relatively larger talon, bearing two cusps, which are more developed than in that species. The specimen is figured by Croizet and Jobert in the Oss. Foss. du Puy-de-Dôme, vol. i. pl. iv. fig. 3.
Croizet Collection. Purchased, 1848.

27650. Fragment of the right ramus of the mandible of a young Hyæna, probably belonging to the present species; from the Upper Pliocene of Ardé, near Issoire. This specimen shows the three milk-molars and the germ of the permanent canine. The second and third milk-molars are longer in proportion to the length of the milk-carnassial than in *H. crocuta*; there is no inner tubercle to mm. 4. This specimen and the last appear to indicate that the present form is distinct from *H. crocuta*.
Croizet Collection. Purchased, 1848.

[1] Oss. Foss. du Puy-de-Dôme, vol. i. p. 169 (1828).

Hyæna sinensis, Owen[1].

Hab China.

It has been suggested by the present writer, in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 288–9, that this species is not improbably the same as the Siwalik *H. felina*. The species is described solely upon the evidence of the three teeth mentioned below, all of which were obtained from a cave in the province of Sechuen (Sez-chuen), N.W. China, near the city of Chung-king-foo.

41937. (*Fig.*) The third right upper premolar. This specimen is figured by Owen in the Quart. Journ. Geol. Soc. vol. xxvi. pl. xxviii. figs. 5, 6.
Purchased from R. Swinhoe, Esq., 1870.

41938. (*Fig.*) The third right lower premolar. This specimen is figured by Owen, *op. cit.* pl. xxviii. fig 7.
Purchased from R. Swinhoe, Esq., 1870.

41939. The lower canine, wanting the greater portion of the crown.
Purchased from R. Swinhoe, Esq., 1870.

Hyæna felina, Bose[2].

Syn. *Hyæna sivalensis*, Falconer and Cautley (*in parte*).

The dentition of this species is of the general type of that of *H. crocuta*, m. 1 being of small size. The first upper premolar is absent in some instances.

Hab. India.

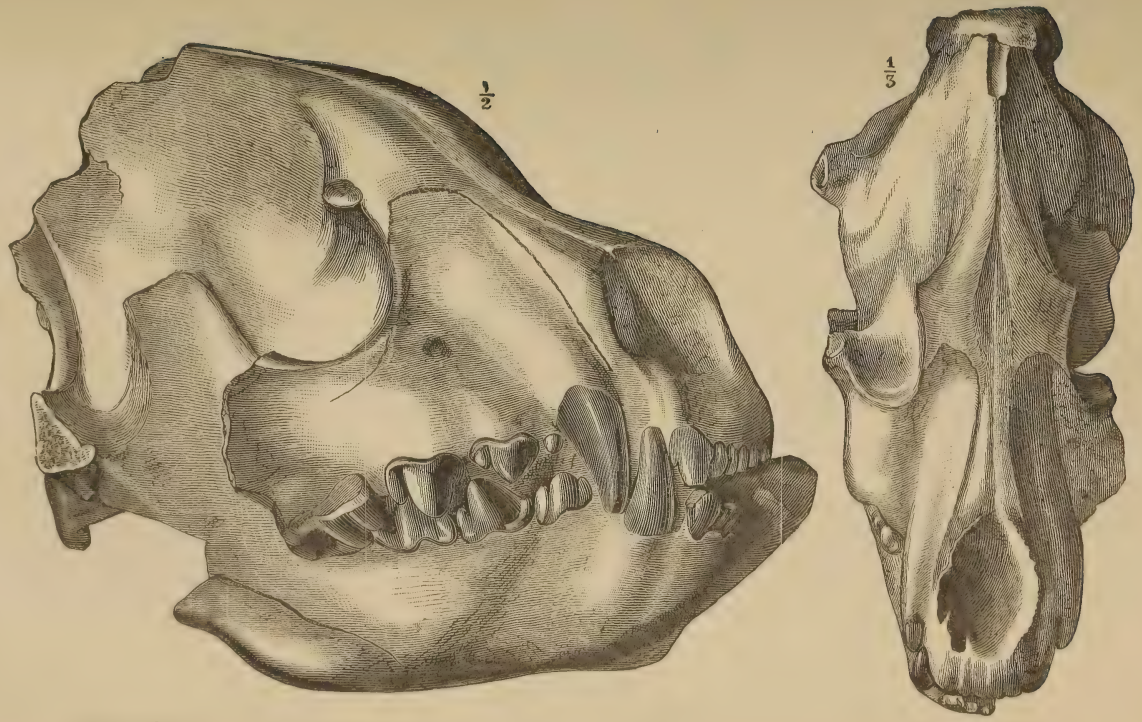
15902. (*Fig.*) Cranium of a very old individual, with the teeth much worn and battered; from the Pliocene of the Siwalik Hills, India. The alveolus of a minute m. 1 may be seen on the right side: pm. 1 is absent. This specimen, which is the type of the species, is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. K.[3] figs. 1, 1 *a*, 1 *b*, 1 *c*; but it wanted at that time the left half of the palate, which has been subsequently added; it is also described and figured by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 130, pl. vi. fig. 6, and is described by the present writer in the 'Palæontologia Indica' in the passage cited below. The accompanying woodcut (fig. 7)

[1] Quart. Journ. Geol. Soc. vol. xxvi. p. 422 (1870).

[2] *Loc. cit.* vol. xxxvi. p. 130 (1880).

[3] This plate was erroneously lettered *Felis cristata* in place of *Hyæna sivalensis*.

A Fig. 7. B



Hyæna felina.—A, oblique view of right side of cranium; B, front view. Science and Art Museum, Dublin.
(From the 'Palæontologia Indica.')

represents another cranium, with the mandible attached, belonging to the present species, which was obtained by Messrs. Baker and Durand from the Siwalik Hills, and is now preserved in the Museum of Science and Art, Dublin. This specimen is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 282–5. The teeth are but little worn, and show that the diastema was short, and that pm. 4 had large fore-and-aft talons; the first upper premolar is present in this specimen. *Cautley Collection. Presented*, 1842.

37138. (*Fig.*) Fragment of the right maxilla, containing the last three premolars and the broken base of a minute m. 1; from the Pliocene of the Siwalik Hills. The greater part of the crown of the carnassial is broken away, and the other teeth are in a middle condition of wear. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 8; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 283, pl. xxxv. A. fig. 2. It is referred to the present species on account of its precise resemblance to the corresponding portion of the Dublin skull; and from being the only specimen exhibiting the inner sides of the undamaged teeth, has been taken as the type specimen of the teeth. The second premolar is relatively long and narrow, and pm. 3 has a relatively low crown with an extremely convex external vertical contour.
Cautley Collection. Presented, 1842.

M. 1549. Cast of the left ramus of the mandible of a sub-adult individual, showing the canine (not fully protruded) and the four cheek-teeth. The original of this specimen is from the Siwaliks of the Punjab, and is in the Indian Museum, Calcutta; it is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 285, pls. xxxvii.–ix. fig. 1. It is referred to the present species from its large size and its agreement with the Dublin skull, especially in the presence of large fore-and-aft talons to pm. 4; the preceding tooth exhibits a highly convex external vertical contour. *Purchased*, 1884.

16565. (*Fig.*) Hinder portion of the right ramus of the mandible, showing the last three teeth in a much battered and worn con-

dition; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. fig. 1; and has been described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 285, pl. xxxix. figs. 2, 2*a*.

Cautley Collection. Presented, 1842

39731. (*Fig.*) Fragment of the left ramus of the mandible of a Hyæna, no improbably belonging to the present species; from the Pliocene of the Siwalik Hills. This specimen shows the broken base of the canine, the second and third premolars, and the carnassial; it is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. figs. 5, 5*a*; and is briefly noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 286, where it is provisionally referred to the present species. It agrees with No. M. 1549 in the long interval between $\overline{\text{pm. 3}}$ and $\overline{\text{m. 1}}$, thus indicating the large size of $\overline{\text{pm. 4}}$; but differs in having a cingulum to $\overline{\text{m. 1}}$, which is a character of the specimens referred to the next species.

Cautley Collection. Presented, 1842.

37141. (*Fig.*) Fragment of the left ramus of the mandible of a Hyæna, containing the last three cheek-teeth in a somewhat broken condition; from the Pliocene of the Siwalik Hills. This specimen has been figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. fig. 7; and is alluded to by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 287, and provisionally referred to the present species[1].

Cautley Collection. Presented, 1842.

M. 1550. Cast of a fragment of the right ramus of the mandible of a Hyæna, containing the last three cheek-teeth in a middle condition of wear. The original of this specimen is from the Pliocene of the Siwalik Hills, and is preserved in the Indian Museum, Calcutta: it is figured and described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 286, where it is provisionally referred to the present species. *Purchased*, 1884.

[1] The number is erroneously given 37140.

16584. (*Fig.*) Distal extremity of the left ramus of the mandible of a Hyæna, containing the broken base of the canine and the three premolars; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. fig. 3; and is alluded to by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 287. Its teeth agree with those of No. 39731, and the two evidently belong to the same species.

Cautley Collection. Presented, 1842.

Hyæna colvini, Lydekker[1].

This species is distinguished from the preceding one by the larger size of the upper true molar, and by the taller and more slender crown of the third upper premolar, and the shorter crown of the second tooth of the same series; the first upper premolar is absent. In the lower jaw the premolars are likewise tall and slender, but there is very great difficulty in determining which jaws belong to this specimen and which to the last. It is highly probable that there is in reality an almost, or quite, complete passage from the last to the present species.

Hab. India.

M. 1552. Cast of the cranium of an adult individual, containing the third and fourth premolars of the right side, and showing the broken bases of most of the other teeth, but wanting the greater part of the left maxilla. The original of this specimen, which is the type of the species, is from the Pliocene of the Siwalik Hills, and is preserved in the Indian Museum, Calcutta; a specimen in the Science and Art Museum, Dublin, is believed to be the missing portion of the left maxilla. The cranium is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 290, pl. xxxv. fig. 2. It shows that pm. 3 is very different from the corresponding tooth of *H. felina* in No. 37138. *Purchased*, 1884.

M. 1551. Cast of the cranium of an immature individual, showing the bases of all the teeth and the complete pm. 2. The original of this specimen is from the Pliocene of the Siwalik Hills, and is preserved in the Indian Museum,

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p 290 (1884).

Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 292, pls. xxxv. fig. 1, xxxvi. fig. 1, and exhibits the distinctive characters of pm. 2, which tooth is very different from the corresponding tooth of *H. felina* in No. 37138.

Purchased, 1884.

37139. (*Fig.*) Fragment of the left maxilla, containing the last two premolars; from the Pliocene of the Siwalik Hills. This specimen, in which m. 1 has probably been broken away, has been figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 7; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 293, pl. xxxv. A. fig. 1. The teeth are very similar to those of the type cranium.

Cautley Collection. Presented, 1842.

37139 a. (*Fig.*) The germ of a right upper carnassial tooth, probably belonging to the present species; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 9.

Cautley Collection. Presented, 1842.

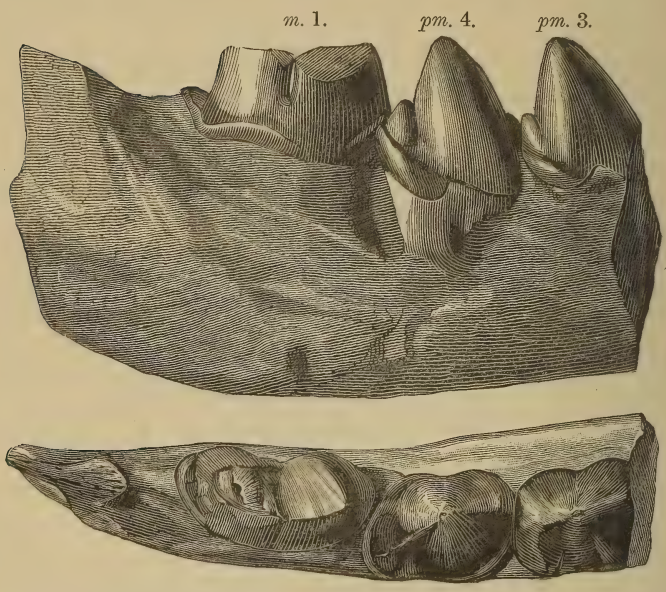
37140. (*Fig.*) Fragment of the left maxilla, containing the last two premolars and the true molar, in a slightly worn condition; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 5; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 293, pl. xxxv. A. figs. 3, 3 *a*. The teeth agree very nearly with those of the type cranium.

Cautley Collection. Presented, 1842.

16578. (*Fig.*) Fragment of the right ramus of the mandible, containing the last three cheek-teeth, in an unworn condition; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis;' and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 296, fig. 14, from which the accompanying woodcut (fig. 8) is taken. The teeth agree so closely with those of the type cranium of the present species, that there is little doubt

but that the specimen should be referred to the same species. The premolars are very different from those of the mandible (No. M. 1549) of *H. felina*, but they come

Fig. 8.



Hyæna colvini.—Part of the right ramus of the mandible; from the Siwalik Hills. $\frac{1}{1}$. (From the 'Palæontologia Indica.')

very near to those of No. 16565. The present specimen and No. M. 1549 have their teeth in precisely the same condition of wear. There is a cingulum to $\overline{\text{m. 1}}$ in the present specimen, which is wanting in No. M. 1549, although present in No. 39731.

Cautley Collection. Presented, 1842.

16526. (*Fig.*) Fragment of the right ramus of the mandible of an immature individual, containing the canine and the three premolars; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 9, and is briefly mentioned by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 296. The teeth are similar to those of the last specimen. *Cautley Collection. Presented*, 1842.

M. 1553. Cast of a fragment of the left ramus of the mandible, showing pm. 4 and m. 1. The original of this specimen is from the Pliocene of the Siwalik Hills, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 295, pls. xxxviii. fig. 3 and xxxix. fig. 4.

Purchased, 1842.

Hyæna eximia, Roth and Wagner[1].

Syn. *Hyæna hipparionum,* Suess (*non* Gerv.), *in parte.*

In this species m. 1 has a large talon, but no inner cusp; m. 1 is large; pm. 1 is present; and in one specimen pm. 1 is absent. Pm. 3 has no anterior talon; and in pm. 4 the inner tubercle is very small, and the third lobe slightly larger than the second.

Hab. Greece and Hungary.

49673. Cast of the complete cranium and mandible, showing the whole of the teeth, in a partially worn condition. The first upper premolar is wanting on both sides, and there is apparently no room for it on the left side. The original is from the Lower Pliocene of Pikermi, Attica, and is preserved in the Museum at Munich. *Purchased*, 1879.

49678. Cast of the left ramus of the mandible of an immature individual; the original is from the Lower Pliocene of Pikermi, and is preserved in the Munich Museum.

Purchased, 1879.

Hyæna antiqua, Lankester[2].

Hab. England.

This is a very doubtful provisional species, founded upon the evidence of the one tooth noticed below; it is said to be allied to *H. striata.*

37983. (*Fig.*) The third upper premolar from the Red Crag (Newer Pliocene) of Felixstowe, Essex. This specimen, which is the type, is described and figured by Lankester in the Ann. Mag. Nat. Hist. vol. xiii. p. 56, pl. viii. figs. 5, 6 (1864).

Purchased, 1864.

[1] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. vii. p. 396 (1854).

[2] Ann. Mag. Nat. Hist. vol. xiii. p. 56 (1864).

Hyæna striata, Zimmermann[1].

Syn. *Hyæna antiquorum*, Temminck.
Hyæna fasciata, Thunberg.
Hyæna intermedia, M. de Serres.
Hyæna monspessulana, Christol.
Hyæna orientalis, Tiedmann.
Hyæna prisca, M. de Serres.
Hyæna veterum, Kæmpfer.
Hyæna virgata, Gray.
Hyæna vulgaris, Desmarest.
Euhyæna striata, Falconer.
Canis hyæna, Linnæus.

In this species the lower carnassial has a large hind talon and inner cusp, and the upper true molar is large; there are large fore-and-aft talons to pm. 3, and the third lobe of pm. 4 is not larger than the second.

Hab. South-western Asia and North Africa (Recent), and South Europe (Pleistocene).

M. 469. Fragment of the left maxilla; from the Pleistocene(?) of the Val d'Arno. This specimen contains the complete carnassial, in a well-worn condition, the hinder half of pm. 3, and the broken base of m. 1.
Enniskillen Collection. Purchased, 1882.

Hyæna sivalensis, Bose[2].

Syn. *H. sivalensis*, Falc. and Caut. (*in parte*).

The permanent dentition of this species is mainly of the type of *Hyæna striata*, but differs by the presence of m. 2. In this character it agrees with the genus *Hyænictis* of Gaudry, but differs by the absence of pm. 1. The absence of the latter, and the minute size of m. 2 in one specimen, coupled with the one instance of the presence of this tooth in *H. crocuta*, induces the present writer to include *Hyænictis* in *Hyæna*.

Hab. India.

37133. (*Fig.*) The nearly complete cranium; from the Pliocene of the Siwalik Hills, India. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. K. figs. 2, 2*a*, 2*b*, 2*c*, and in 'Falconer's Palæontological

[1] Specimen Zool. Geog. p. 366 (1777).

[2] Quart. Journ. Geol. Soc. vol. xxxvi. p. 128 (1880). The name *H. sivalensis*, Falc. and Caut., has been dropped.

Memoirs,' vol. i. pl. xxv. figs. 1–4, being in both instances erroneously named *Felis cristata*. It is also described by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 128; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 304, 305, pl. xxxiv. It is the type specimen of the species, and exhibits the three last premolars and the first true molar, the latter being of unusually large size; the sockets of pm. 1 are also visible, as well as a portion of the canine of the right side. *Cautley Collection. Presented*, 1842.

37136. (*Fig.*) Anterior portion of the cranium; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. K. figs. 4, 4*a*, 4*b*; and has been noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 306. It has been somewhat damaged by rolling, but comprises the greater part of the skull as far back as the middle of the brain-case, where it is broken off by an oblique fracture. The teeth are much worn and broken; but the whole of the four premolars are present, and the left pm. 4 exhibits clearly the subequality in size of its three lobes. The superior aspect is extremely like that of the skull of *H. striata*; and the large postorbital processes of the frontals are well displayed, and, in conjunction with the corresponding zygomatic processes, enclose a large portion of the hinder border of the orbit.

Cautley Collection. Presented, 1842.

37134. (*Fig.*) The hinder portion of the cranium; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. K. figs. 3, 3*a*, 3*b*; and is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 306. It agrees precisely in size and general form with the two skulls noticed above, and doubtless belongs to the same species. It exhibits the sagittal crest more fully developed than in the type skull, and is therefore nearer to *H. striata*. *Cautley Collection. Presented*, 1842.

16555. (*Fig.*) The greater portion of the left ramus of the mandible; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. figs. 2, 2*a*; and is described and figured by the

present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 306, pl. xxxviii. fig. 5 and xxxix. fig. 7. It is complete, with the exception of the summit of the coronoid process, and shows the whole of the dentition, the cheek-teeth being much worn and the greater part of the crown of the canine broken away. A fragment of the right ramus is attached to the symphysis; while the condyle is still clasped by the glenoid cavity, which has been torn away from the skull. Behind the carnassial there is the broken root of an exceedingly minute $\overline{\text{m. 2}}$, which the present writer had not detected in the notice quoted above[1]. The small size of this tooth evidently indicates one on the point of disappearance; and from this circumstance, and the absence of $\overline{\text{pm. 1}}$ and its presence in *H.* (*Hyænictis*) *græca*, the writer is not inclined to alter his previously expressed opinion as to the advisability of including *Hyænictis* in *Hyæna*. *Cautley Collection. Presented*, 1842.

M. 554. Cast of a fragment of the right ramus of the mandible, containing $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$, in an unworn condition. The original of this specimen was obtained from the Pliocene Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It has been described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 307, pls. xxxviii. fig. 2 and xxxix. fig. 5. Behind the carnassial there is the empty cylindrical alveolus of a small second true molar, which must, however, have been considerably larger than the corresponding tooth of the last specimen. In this specimen $\overline{\text{m. 1}}$ has a large talon (the summit broken) and a relatively small blade, on the inner side of the hinder lobe of which there is a small cusp. *Purchased*, 1884.

16585. (*Fig.*) Fragment of the left ramus of the mandible, containing the incisors, canine (broken), and the second and third premolars; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. figs. 6, 6*a*.
Cautley Collection. Presented, 1842.

15714. (*Fig.*) Distal portion of the right ramus of the mandible, showing $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$, and the broken bases of the incisors, canine, and $\overline{\text{pm. 4}}$; from the Pliocene of the Siwalik Hills.

[1] It has been made visible by subsequent cleaning.

This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. M. figs. 4, 4*a*; and is mentioned by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 308.

Cautley Collection. Presented, 1842.

14618. Fragment of the left ramus of the mandible, showing $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$, in a well-worn condition; from the Pliocene of the Siwalik Hills. *Cautley Collection. Presented*, 1842.

15917. Fragment of the left ramus of the mandible, showing $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$, in a partially worn condition; from the Pliocene of the Siwalik Hills. *Cautley Collection. Presented*, 1842.

Hyæna macrostoma, Lydekker[1].

In this species, which is apparently closely allied to the Pikermi *H. chœretis*, the first lower premolar is present, and it is highly probable that $\overline{\text{m. 2}}$ was likewise present. The cheek-teeth and cranium exhibit many well-marked canoid and viverroid characters. Since describing this species in the 'Palæontologia Indica,' the writer has noticed that *H. chœretis*, Gaudry, has been referred by Hensel, in the Monatsb. k. preuss. Ak. Wiss. 1862 (volume for 1863), p. 567, to a distinct genus, under the name of *Lycyæna*. The present species would likewise belong to the same genus; but the writer being strongly opposed to the multiplication of generic terms, prefers to continue to class it with *Hyæna* and to abolish the term *Lycyæna*.

Hab. India.

M. 1547. Cast of the nearly complete cranium, with the crowns of all the teeth, except one carnassial and the true molars, hammered off. The original of this specimen, which is the type of the species, was obtained from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 298, pls. xxxvi. fig. 2 and xxxvii. *Purchased*, 1884.

M. 1548. Cast of the anterior part of the left ramus of the mandible. The original of this specimen was obtained from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 301, pls. xxxviii. fig. 4 and xxxix. fig. 6. The specimen shows anteriorly the broken bases of two incisors,

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 298 (1884).

the base of the canine, of pm. 1 and pm. 2, the nearly complete pm. 3 and pm. 4, and the alveoli of m. 1, behind which it is broken off. Part of the summit of pm. 4 has been carried away; but this and the preceding tooth are otherwise nearly perfect, and being considerably worn indicate that the jaw belonged to a fully adult animal. The two remaining premolars are constructed on the type of those of *Hyæna*, but are considerably longer and narrower than those of any existing species of the genus.

Purchased, 1884.

Specifically Undetermined Hyæna-Remains.

From the Pliocene of the Siwalik Hills, India.

37137. (*Fig.*) Fragment of a right maxilla, containing the broken base of pm. 1, the other three premolars in a half-worn condition, and the base of m. 1. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. figs. 6, 6*a*; and is noticed and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 309, who was unable to refer it to either of the four species of Siwalik Hyænas noticed above.

Cautley Collection. Presented, 1842.

39718. (*Fig.*) Anterior extremity of a cranium, in a much-damaged condition. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. figs. 1, 1*a*. It exhibits the base of a pm. 1.

Cautley Collection. Presented, 1842.

15915. The occipital half of the base of a cranium.

Cautley Collection. Presented, 1842.

16583. (*Fig.*) Fragment of the right maxilla and premaxilla, showing the incisors, canine, and the alveoli of pm. 1 and pm. 2. This specimen, which belongs to an immature individual, is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 2; and not improbably belongs to *H. sivalensis*. *Cautley Collection. Presented*, 1842.

39719. (*Fig.*) The right premaxilla, containing the three incisors. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. L. fig. 3.

Cautley Collection. Presented, 1842.

15916. The olecranal extremity of the left ulna of a Carnivore, pro-

bably belonging to the present genus. This bone differs from the ulna of *Hyæna crocuta* in the less-complete development of the lower sigmoid cavity and in the wider posterior surface; the two are, however, in other respects very similar. *Cautley Collection. Presented*, 1842.

Genus **LEPTHYÆNA**, Lydekker[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. ?, M. $\frac{?}{2}$.

Lepthyæna sivalensis, Lydekker[2].

Syn. *Ictitherium sivalense*, Lydekker[3].

Hab. India.

1555–6. Casts of two associated fragments of the mandible, containing the two last premolars, the carnassial (imperfect posteriorly), and the alveolus of $\overline{m.\ z}$. The original of this specimen, which is the type of the genus and species, is preserved in the Indian Museum, Calcutta, and was obtained from the Siwaliks of the Punjab. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 312, pl. xlv. figs. 8, 9, 9*a*. *Purchased*, 1884.

Family VIVERRIDÆ.

Genus **ICTITHERIUM**, Wagner[4].

Syn. *Thallasictis*, P. Gervais[5] (*ex* Nordmann).
Galeotherium, Wagner[6].
Palhyæna, P. Gervais[7].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{2}$.

Ictitherium hipparionum (P. Gervais[8]).

Syn. *Hyæna hipparionum*, P. Gervais[9].
Palhyæna hipparionum, P. Gervais[10].

Hab. Europe.

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 312 (1884).
[2] Rec. Geol. Surv. Ind. vol. x. p. 32 (1877), *Ictitherium*. [3] *Loc. cit.*
[4] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. v. pt. 2, p. 335 (1848).
[5] Zool. et Pal. Françaises, 1st ed. vol. i. p. 120 (1848–52).
[6] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. iii. pl. i. (1840). This name has the priority over *Ictitherium*.
[7] Zool. et Pal. Françaises, 2nd ed. p. 242 (1858).
[8] Ann. Sci. Nat. Zool. ser. 3, vol. v. p. 261 (1846), *Hyæna*. [9] *Ibid.*
[10] Zool. et Pal. Françaises, 2nd ed. p. 242 (1858).

28121. A metatarsal and a proximal phalangeal; from the Lower Pliocene of Cuçuron (Vaucluse), France.
Bravard Collection. Purchased, 1852.

Ictitherium robustum (P. Gervais[1]).

Syn. *Thallasictis robusta*, P. Gervais[2].
Ictitherium viverrinum, Roth and Wagner[3].

Hab. Europe.

49676. Cast of the cranium and mandible. The originals are in the Museum at Munich, and were obtained from the Lower Pliocene of Pikermi, Attica. *Purchased*, 1879.

Genus **PALÆOPRIONODON,** Filhol[4].

Dentition :—I. $\frac{?}{3}$, C. $\frac{?}{1}$, Pm. $\frac{?}{4}$, M. $\frac{?}{2}$. The second lower molar is small, and there is a minute inner cusp to $\overline{\text{m. 1}}$, by which the genus is distinguished from the musteline genus *Plesictis*. The genus seems to pass almost insensibly in one direction into the feline genus *Pseudælurus*, and in another through *Stenoplesictis* to *Cynodictis*. The lower teeth are exceedingly like those of *Prionodon*.

Palæoprionodon mutabilis, Filhol[5].

Syn. *Plesiogale mutabilis*, Filhol.
Palæoprionodon lamandini, Filhol.
Palæoprionodon lamandini, var. *mutabilis*, Filhol.

History. In 1877 Filhol (Ann. Sci. Géol. vol. viii. art. 1, p. 42, vol. vii. pl. xxv. figs.[6] 110–113) described and figured certain mandibles of a viverrine Carnivore under the name of *Plesiogale mutabilis*. In 1880 (Compt. Rend. vol. xc. p. 1579) he described another lower jaw under the name *Palæoprionodon lamandini*. In 1882 (Ann. Soc. Sci. Phys. Nat. Toulouse, p. 68, pl. iv. fig. 4) the same writer figured and fully described the lower jaw on which that species was founded. At the same time (*ibid.* p. 74) he came to the conclusion that the so-called *Plesiogale mutabilis* was only a variety of *Palæoprionodon lamandini*, and proposed to call it by the name of *Palæoprionodon lamandini*, var *mutabilis*. It is clear, however,

[1] Zool. et Pal. Françaises, 1st ed. vol. i. p. 120 (1848–52), *Thallasictis*.
[2] *Ibid.*
[3] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. viii. pt. 1, figs. 5, 6 (1857).
[4] Comptes Rendus, vol. xc. p. 1579 (1880).
[5] Ann. Sci. Géol. vol. viii. art. 1, p. 42 (1877), *Plesiogale*.
[6] There is some incorrectness in the references to these figures.

that the name *mutabilis* has the priority and must stand for the species, the type of which will be the original *Plesiogale mutabilis*; the name *lamandini*, if employed at all, should be used in a varietal sense for the form with a large $\overline{\text{m. 2}}$, figured in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. iv. fig. 4.

Hab. France.

M. 1643. Two specimens of part of the right ramus of the mandible, showing the third and fourth premolars, the carnassial, and the alveoli of $\overline{\text{m. 2}}$ and the other teeth; from the Upper Eocene of Bach, near Lalbenque (Lot), France. These specimens appear to agree precisely with the form figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxv. figs. 112, 113, under the name of *Plesiogale mutabilis*.

Purchased, 1884.

M. 1369. The greater portion of the right ramus of the mandible, containing the canine and all the cheek-teeth except $\overline{\text{pm. 1}}$ (of which the crown is broken off); from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen appears to agree precisely with the mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxv. figs. 110, 111, under the name of *Plesiogale mutabilis*, and that in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. iv. fig. 1, under the name of *Palæoprionodon lamandini*, var. *mutabilis*; both these specimens differing slightly from the preceding specimens. *Purchased*, 1884.

Palæoprionodon, sp.

Hab. Europe.

M. 1370. The greater portion of the left ramus of the mandible, containing the canine and all the cheek-teeth; from the Upper Eocene of Caylux. In this specimen the length of the space occupied by the last four cheek-teeth is the same as in No. M. 1369; the interval between $\overline{\text{pm. 3}}$ and the canine is, however, considerably less, and $\overline{\text{pm. 2}}$ is smaller. The second true molar is small, and there is a distinct inner cusp to the carnassial. It is not improbable that these differences should be regarded as of specific value. *Purchased*, 1884.

M. 1644. Symphysial extremity of the left ramus of the mandible, very similar to the last specimen; from the Upper Eocene of Bach. *Purchased*, 1884.

Palæoprionodon, sp.

Hab. France.

M. 1371. The greater portion of the left ramus of the mandible, containing the canine and all the cheek-teeth except $\overline{\text{pm. 1}}$; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. In this specimen the space occupied by the cheek-teeth is the same as in No. M. 1370; but $\overline{\text{pm. 2}}$ is larger, the crowns of the other cheek-teeth lower, and the ramus of the jaw considerably more slender. These distinctive characters are not improbably of specific value. *Purchased*, 1884.

M. 1373. The greater portion of the left ramus of the mandible; from the Upper Eocene of Caylux. This specimen, which is in every respect similar to the last, contains the last three cheek-teeth and the alveoli of the first three premolars and the canine. *Purchased*, 1884.

Genus **STENOPLESICTIS,** Filhol[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{2}$. The present genus connects *Palæoprionodon* with *Cynodictis*; and also presents an approximation to the *Mustelidæ*. In typical forms the lower carnassial has a distinct inner cusp, but this disappears in some varieties; the last lower premolar has fore-and-aft talons. The characters of the upper dentition will be gathered from the description of the specimen noticed below.

Stenoplesictis cayluxi, Filhol[2].

Hab. France.

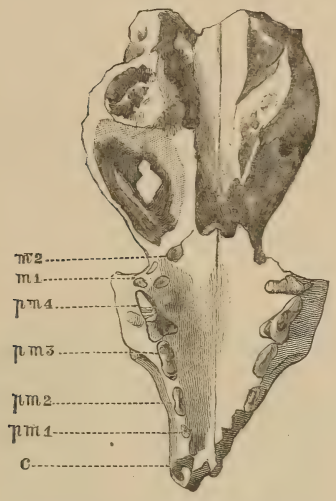
M. 1723. (*Fig.*) The cranium, imperfect anteriorly and posteriorly; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. A specimen of the cranium has been described by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pp. 66–7, but is not figured. The present specimen, which is represented in the accompanying woodcut (fig. 9), agrees precisely with the description of the type specimen; the length of the space occupied by the cheek-teeth being 0,0255 in the present and 0,027 in the type specimen.

[1] Comptes Rendus, vol. xci. p. 345 (1880).

[2] *Loc. cit.*

On the left side the specimen shows the alveolus of the canine, the broken base of pm. 1, the other three premolars in a perfect condition, the broken base of m. 1, and the extremely minute alveolus[1] of m. 2. The right side shows the last three premolars and the first true molar, in an uninjured condition. The first three premolars agree very

Fig. 9.



Stenoplesictis cayluxi.—Palatal aspect of the cranium; from the Upper Eocene of Caylux. ½.

closely with those of *Viverra malaccensis*; the third tooth wanting the inner cusp which occurs in *Herpestes*. The inner tubercle of the carnassial is small, as in *Mustela*. The first true molar is similar to that of *Herpestes*; and the alveolus of the second molar is only slightly smaller than in some species of the same genus. The posterior border of the palate extends only a slight distance behind the last molar, which is a character of some species of *Viverra* (woodcut, fig. 10, p. 98), and is different from *Herpestes* and *Mustela*. The elongated form of the skull is a viverrine character. In the mandible (Filhol, Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. vi. figs. 7, 8, 9) the inner cusp of the carnassial is less distinct than in

[1] This is made rather too large in the figure

Herpestes, and the anterior talon of $\overline{\text{pm. 4}}$ is more strongly developed[1].

On the whole it appears that the present form is decidedly a viverrine; and presents well-marked affinities both with *Viverra* and *Herpestes*. In the tendency to the disappearance of $\underline{\text{m. 2}}$ and the form of the upper carnassial there are indications of a transition to *Prionodon* and the musteline genus *Plesictis*, which presents viverrine affinities in the form of $\underline{\text{m. 1}}$. *Purchased*, 1884.

Genus **VIVERRA**, Linn.[2]

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{(3-4)}$, M. $\frac{2}{2}$. The accompanying woodcut (fig. 10) shows the characters of the upper dentition in the existing *Viverra zibetha* of India.

Fig. 10.

Viverra zibetha, Linn.—Palate. $\frac{1}{1}$. (From the 'Palæontologia Indica.')

[1] The mandible of the present form is much larger than that of *Herpestes minimus* (woodcut, fig. 12, p. 101); and is also distinguished by the higher crowns of the teeth, the shorter $\overline{\text{m. 2}}$, and the presence of a distinct anterior talon to $\overline{\text{m. 4}}$.

[2] Syst. Nat. ed. 12, vol. i. p. 63 (1766).

Viverra bakeri, Bose[1].

Syn. *Canis*? sp., Falc. and Caut.

Hab. India.

40183. (*Fig.*) Cranium, much damaged posteriorly and superiorly, but exhibiting the last four cheek-teeth of either side; from the Pliocene of the Siwalik Hills, India. This specimen, which is the type, is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. Q. figs. 1, 1 *a*, 1 *b*, 1 *c*, where it is doubtfully referred to *Canis*; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 269, pl. xxxiii. figs. 1, 1 *a*. In the relative size of the carnassial teeth this specimen is nearer to *V. zibetha* than to *V. civetta*, from which it is concluded that the species cannot in all probability have been the ancestor of the African *V. civetta*; it is, however, extremely probable that it may have given rise to the Indian *V. zibetha*, the reduced size of the true molars of the latter being a later specialization.

Cautley Collection. Presented, 1842.

40180. (*Fig.*) Fragment of the left maxilla, containing pm. 4 and m. 1; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. Q. fig. 3; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 270, pl. xxxiii. fig. 2.

Cautley Collection. Presented, 1842.

Viverra durandi, Lydekker[2].

Syn. (?) *Canis*, sp., Falc. and Caut.

Hab. India.

M. 1338. (*Fig.*) Cranium, wanting the anterior portion; from the Pliocene of the Siwalik Hills, India. This specimen, which is the type of the species, shows the last three cheek-teeth of either side in fair preservation. On the left side the zygomatic arch is preserved; but the specimen is so fragile that it has not been deemed advisable to clear it from the matrix. It is described and figured by the present writer

[1] Quart. Journ. Geol. Soc. vol. xxxvi. p. 131 (1880).

[2] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 271 (1884).

in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 271, pl. xxxiiii. fig. 3. This species is the largest known Civet; and in respect of dental characters is more nearly allied to the Indian *V. zibetha* and *V. bakeri* than to the African *V. civetta*; presenting in some respects characters intermediate between the two former. In its cranial characters it is markedly distinct from each of the other three species. *Presented by Prof. George Busk*, 1883.

37150. (*Fig.*) Anterior portion of the cranium, wanting the extremity of the premaxillæ and all the teeth, which have fallen from their sockets; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in the 'Fauna Antiqua Sivalensis,' pl. Q. figs. 2, 2 *a*, where it is doubtfully referred to *Canis*; and is described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 273. *Cautley Collection. Presented*, 1842.

37131. Hinder portion of the cranium of a large Civet, apparently belonging to the present species; from the Pliocene of the Siwalik Hills. *Cautley Collection. Presented*, 1842.

Viverra hastingsiæ, Davies[1].

This species is about the size of *Canis vulpes*, and presents characters connecting it with *Herpestes* and *Cynodictis*; its nearest ally probably being *Viverra antiqua* of the Lower Miocene of St. Gérand-le-Puy.

Hab. England.

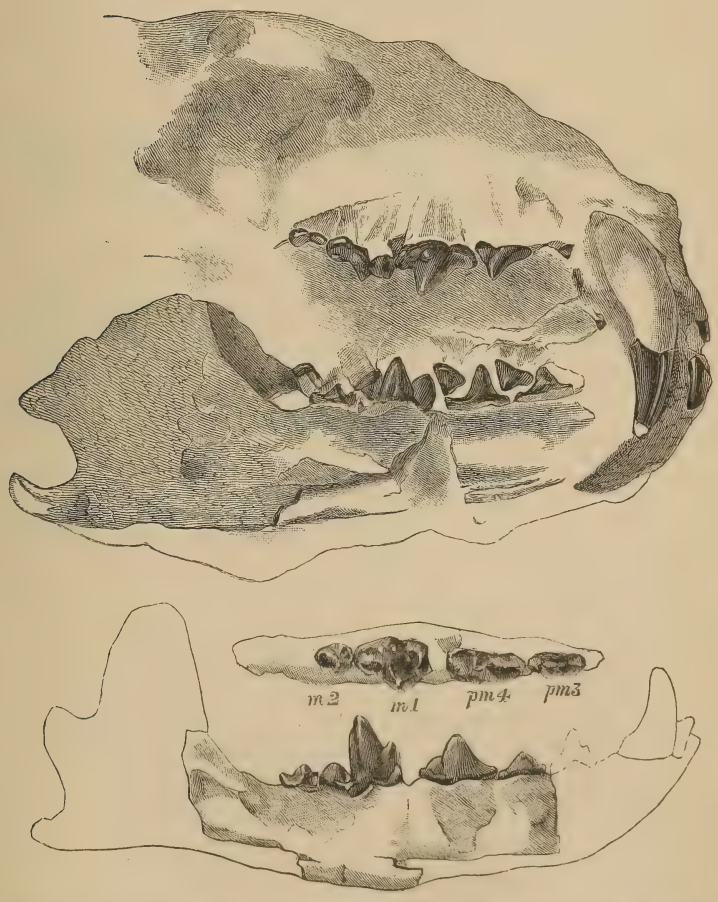
30203. (*Fig.*) The associated cranium and mandible; from the Headon beds (Upper Eocene) of Hordwell, Hampshire. This specimen is the type of the species, and is described and figured by Davies in the Geol. Mag. dec. 3, vol. i. p. 433, pl. xv. The specimen, which is figured in the woodcuts (figs. 11 and 12), is on the whole in very perfect condition, and exhibits all the dentition. The anterior cervical vertebræ are still in contact with the occiput. The penultimate upper premolar (pm. 3, fig. 12) exhibits an inner cusp, as in *Herpestes*. The upper carnassial (pm. 4, fig. 12) and the true molars (m. 1, m. 2) are also like the corresponding teeth of that genus. The inner cusp of $\overline{\text{m. 1}}$ is largely developed. *Hastings Collection. Purchased*, 1855.

[1] Geol. Mag. dec. 3, vol. i. p. 437 (1884).

Fig. 11.

Viverra hastingsiæ.—Masticatory aspect of the right upper cheek-dentition of the same specimen as fig. 12.

Fig. 12.



Viverra hastingsiæ.—Cranium and mandible from the Headon beds of Hordwell. The two lower figures show the upper and outer aspects of the right ramus of the mandible. ½.

Viverra angustidens, Filhol[1].

Hab. France.

M. 1358. Anterior portion of the left ramus of the mandible, containing the canine and the four premolars, the crown of $\overline{\text{pm. 1}}$ being broken off; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees with the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxvi. figs. 121–2, in the extremely minute size of $\overline{\text{pm. 1}}$; $\overline{\text{pm. 2}}$ is, however, rather smaller in the present specimen than in the type, and has apparently but one root.
Purchased, 1884.

Genus **AMPHICTIS,** Pomel[2].

This genus is mainly distinguished from existing species of *Viverra* by the form of the second lower true molar, which is elongated and implanted by two distinct roots.

Amphictis antiqua, Pomel[3].

The mandible of this species was originally referred by De Blainville to his *Viverra antiqua* (*Herpestes antiquus*, Pomel), and a similar specimen is figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxviii. figs. 8, 8 *a*, under the same name, although a doubt is expressed in the text as to the correctness of the generic reference. It has beeen shown by Filhol[4] that there is a very considerable probability that the mandibles which he has figured under the name of *Herpestes antiquus*[5] are really those of *Viverra antiqua*. The length of the space occupied by the six cheek-teeth in those specimens is 0,041.

Hab. France.

31057. Fragment of the right ramus of the mandible, containing the last three premolars, the anterior half of $\overline{\text{m. 1}}$, and the alveoli of the canine and $\overline{\text{pm. 1}}$; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen appears to agree exactly with the mandible figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxviii. figs. 8, 8 *a*, under the name of *Viverra antiqua*, which is very similar

[1] Ann. Sci. Géol. vol. vii. art. 7, p. 144 (1876).
[2] Catalogue Méthodique, p. 63 (1853).
[3] *Ibid.*
[4] Ann. Sci. Géol. vol. x. art. 3, p. 166.
[5] The description in the text is headed *Herpestes priscus*, but in the Arch. Mus. Lyon, vol. iii. art. i. p. 63, this is corrected.

to the specimens figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xxiv. figs. 1–4, under the name of *Amphictis antiqua*. *Bravard Collection. Purchased*, 1852.

31058. The left ramus of the mandible of an immature individual, showing the milk and permanent dentition; from the Lower Miocene of St. Gérand-le-Puy.
Bravard Collection. Purchased, 1852.

31058 a. The distal half of the femur; apparently associated with the last. *Bravard Collection. Purchased*, 1852.

Amphictis, sp. (*cf. A. leptorhyncha*, Pomel[1]).

Hab. France.

26705. The greater portion of the left ramus of the mandible, showing the alveoli of the canine and $\overline{\text{pm. 1}}$, the other three premolars in a perfect condition, and the alveoli of the two true molars; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen differs from the mandible of *A. antiqua* (No. 31037) by its generally more slender form, by the absence of a distinct interval between $\overline{\text{pm. 1}}$ and $\overline{\text{pm. 2}}$, and the presence of one between pm. 2 and $\overline{\text{pm. 3}}$. In these respects the specimen appears to agree with Pomel's *A. leptorhyncha*, of which it is not improbable that the present specimen is the type [2]. In the Zool. et Pal. Françaises, 2nd ed. p. 223, it is stated that this specimen had been referred by Pomel to the genus *Amphicneumon*. The length of the space occupied by the six cheek-teeth is 0,039; and the second true molar is inserted by two distinct fangs.
Pomel Collection. Purchased, 1851.

Genus, *non det.*

Hab. France.

M. 1381. The hinder portion of the cranium of a Viverroid, not improbably belonging either to *Viverra* or *Amphictis*; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen is considerably smaller than the cranium of *Viverra antiqua* figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xix. *Purchased*, 1884.

[1] Catalogue Méthodique, p. 63 (1853).

[2] Filhol (Ann. Sci. Géol. vol. x. art. 3, p. 176) mentions that he could find no specimen referable to this species.

Genus **HERPESTES**, Illiger[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{(3-4)}$, M. $\frac{2}{2}$. In existing forms the inner cusp of the lower carnassial is well developed and its talon short. $\overline{\text{m. 2}}$ is short, with three main cusps; $\overline{\text{pm. 4}}$ has a cusp on its posterior cutting-edge. Fossil forms seem to indicate a complete transition from *Viverra* to *Herpestes*.

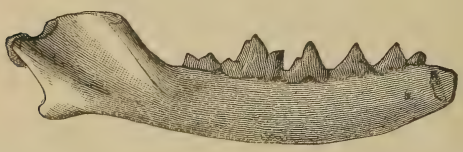
Herpestes minimus (Filhol[2]).

Syn. *Viverra minima*, Filhol[3].

Hab. France.

M. 1372. (*Fig.*) The greater portion of the right ramus of the mandible, containing all the cheek-teeth, and showing the broken base of the canine; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen, which is represented in the accompanying woodcut (fig. 13), on an

Fig. 13.



Herpestes minimus.—Part of the right ramus of the mandible; from the Upper Eocene of Caylux. $\frac{3}{2}$.

enlarged scale, appears to agree exactly with the less perfect specimen figured by Filhol in the Ann. Sci. Géol. vol. viii. pl. xx. figs. 334, 336, under the name of *Viverra minima*. The first premolar is present, and of comparatively large size; and there is a large inner cusp to the carnassial. The space occupied by the six cheek-teeth measures 0,022, or the same as in the type specimen. The present specimen is very slightly larger than the mandible of the existing Indian *Herpestes nipalensis*, but is otherwise very similar. The only points of difference, indeed, between the two are that $\overline{\text{m. 2}}$ is relatively larger in the fossil, that the cusp on the posterior cutting-edge of $\overline{\text{pm. 4}}$ is placed on the median line, instead of to the outer

[1] Prodromus Syst. Mamm. p. 135 (1811).
[2] Ann. Sci. Géol. vol. vii. art. 7, p. 150 (1876), *Viverra*.
[3] *Loc. cit.*

side, as is generally the case in existing species, and that the anterior border of the coronoid process inclines backward to a considerably greater extent, thus indicating a form of jaw of inferior biting-power. The lower jaw of the existing African *H. gracilis* is also of nearly the same size as the fossil, but, in addition to the points distinguishing the jaw of *H. nipalensis* from the latter, differs in the very general absence of $\overline{\text{pm. 1}}$ and the considerably smaller size of that tooth when present. It does not appear that any other of the living species (most of which are of considerably larger size) comes so near to the fossil as *H. nipalensis*. Although the lower teeth of *Genetta* are very like those of *Herpestes*[1], yet the inner cusp of the carnassial is usually less strongly developed in the former, and in this respect the fossil differs from the smaller Genets, although the form of the hinder part of the jaw is more like that of *Genetta*. The extremely close resemblance of the dentition of the fossil to *H. nipalensis* renders it extremely probable that it should be referred to the same genus rather than to *Viverra*.

All the sufficiently described fossil species of the genus are of considerably larger size than the present specimen; and this is especially the case with *H. crassus*, Filhol[2], and the so-called *H. antiquus*[3], Pomel, which appears to be the same as *Viverra antiqua*, Blainv.

It may be added that the present specimen is distinguished from *Mustela gracilis*[4] by the absence of any interval between the anterior premolars, by the larger size of $\overline{\text{pm. 1}}$, of the inner cusp of $\overline{\text{m. 1}}$ (which is only rudimentary in that form), and of $\overline{\text{m. 2}}$. It is distinguished from *Cynodictis exilis*[5], which is of nearly the same size, by the absence of $\overline{\text{m. 3}}$, and by the larger and lower crown of the carnassial, which does not exceed the height of the premolars[6]. *Purchased*, 1884.

[1] *Vide* Mivart, Proc. Zool. Soc. 1882, p. 177.

[2] Arch. Mus. Lyon, vol. iii. p. 63, pl. iv. figs. 10, 11.

[3] *Vide* Filhol, Ann. Sci. Géol. vol. x. art. 3, pp. 161–163, pl. xxiv. figs. 5–9 (wrongly named *H. priscus* in letterpress, *vide* Arch. Mus. Lyon, *loc. cit.*).

[4] *Vide* Filhol, Ann. Sci. Géol. vol. viii. art. 1, p. 45, *Plesiogale*.

[5] *Ibid.* vol. vii. art. 7, pl. xxiv. figs. 97–101 (misnamed *Cynodictis gracilis* in the description of the plates; the real mandible of the latter is represented in vol. viii. pl. xx. fig. 337).

[6] The present specimen has been already referred to *Herpestes* by the present writer in the Geol. Mag. dec. 3, vol. i. p. 442 (1884).

M. 1374. The greater portion of the right ramus of the mandible, containing all the cheek-teeth except $\overline{\text{pm. 1}}$; from the Upper Eocene of Caylux. This specimen is precisely similar to the last. *Purchased*, 1884.

Genus *non det.* (*serial position uncertain*).

Hab. England.

36791. Portion of the cranium; from the Headon beds (Upper Eocene) of Hordwell, Hampshire. This specimen has been described by Davies in the Geol. Mag. dec. 3, vol. i. p. 437 (1884), who was unable to determine its affinities. It indicates an animal of considerably larger dimensions than *Viverra hastingsiæ* (p. 100). It shows a canine and three premolars in fair preservation; and one premolar and a carnassial, with their crowns broken, are present in their respective alveoli. *Presented by Samuel Laing, Esq.*, 1862.

Family URSIDÆ.

In the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 202–204, the present writer has shown that it is impossible to draw any distinction of more than generic value between the Canoids and the Ursoids. and he accordingly united the two modern families of the *Canidæ* and *Ursidæ*, adopting the latter name as the family one[1]. The same arrangement has been adopted in the present work. It may, however, be observed that there are almost equally strong reasons for uniting the Canoids and Viverroids; but as it is absolutely necessary to have a certain number of divisions, the family *Viverridæ* is maintained.

Although, as above said, it is logically impossible to draw any divisions of family value between the different genera of the *Ursidæ* as thus extended, yet the convenience of having some division for working purposes among such a multitude of genera is so great, that it will be found advisable to rank the most Bear-like genera under one arbitrary group, and the most Dog-like under another. These two groups may respectively be termed *Ursinæ* and *Caninæ*, and their most typical representatives will be the members of the modern families *Ursidæ* and *Canidæ*. The genus *Dinocyon* will be ranked under the first group, on account of at least one of the species

[1] Were it not for the inadvisability of introducing new terms, and the intrinsic objection to the name *Hyænarctos*, the name *Hyænarctidæ* would be in many respects more advisable for the family name.

referred to it[1] having an upper carnassial of the *Hyænarctos* type; but it must be distinctly understood that its separation from the true Dogs is a purely arbitrary one, it being connected with the group through *Cephalogale* just as intimately as it is with the Bears through *Hyænarctos*.

Subfamily Caninæ.

Genus **CYNODICTIS,** Bravard and Pomel[2].

Dentition and Affinities.—In typical forms the dentition of this genus is numerically the same as that of typical forms of *Canis*, or I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$. In some species, e. g. *C. compressidens*, however, the last lower molar is normally very small, and in some instances is entirely absent[3]; those races in which this tooth is absent being frequently distinguished by the varietal name of *viverroides*. In those races the dentition is very close to certain Viverroids (e. g. *Amphictis* and *Herpestes*), the blade of the lower carnassial being tall and the inner cusp large, and placed relatively far forwards, the "cusp-line" being transverse. The dentition of *Herpestes* is, however, distinguished by the presence of an inner cusp to the upper third premolar, and by the smaller size of the second lower true molar. In other forms (e. g. *C. leptorhyncha*[4]) the blade of the lower carnassial is relatively low, the inner cusp small, and the "cusp-line" slightly oblique; and the dentition is then but very slightly removed from that of some of the least specialized species of *Canis*, like the existing *C. bengalensis* and the fossil Indian *C. curvipalatus* (although a "meinocreodont" character is more marked in the *Cynodictis*); and it thus seems probable that there is an almost perfect transition from *Cynodictis* to *Canis*, the genera *Cynodon* (distinguished by the absence of a cusp on the posterior cutting-edge of pm. 4) and *Amphicynodon* being allied forms. One variety of *C. leptorhyncha* has, however, lost its last lower molar, and thereby shows a viverrine

[1] It should be observed that the writer, after a suggestion of Filhol, refers the so-called *Hyænarctos hemicyon* to this genus, under the name of *Dinocyon hemicyon* (*vide* 'Palæontologia Indica,' *op. cit.*).

[2] Notice sur les Ossemens Fossiles de la Débruge, p. 5 (1850). This reference is given by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. p. 216. The present writer has been unable to find the memoir quoted in any of the lists to which he has access, and it is probable that it was published on the Continent in a separate form, and that copies never reached the English scientific libraries. The writer is unable to say whether any specific names were given in this memoir.

[3] *Vide* Filhol, Ann. Soc. Sci. Phys. Nat. Toulouse, 1882 ("Notes sur quelques Mammifères fossiles des Phosphorites du Quercy").

[4] *Vide* Filhol, Ann. Sci. Géol. vol. vii. pls. xxi., xxii.

tendency. Huxley has indicated a strong resemblance between the skulls of some species of *Cynodictis* and certain existing American forms of *Canis*; and the close resemblance of the skeleton of *Cynodictis* to that of *Amphicyon* has been noticed by Filhol, who has also shown that in some of the larger forms the lower dentition is very like that of *Amphicyon*, which is again very like *Cephalogale*. The humerus of *Cynodictis* (or, at all events, of most of the species) had an entepicondylar foramen, thereby differing from that of *Canis*, and agreeing with *Viverra*, *Amphicyon*, and *Cephalogale*.

It thus appears that *Cynodictis* is an extremely generalized genus, connecting the Viverroids and the Canoids so intimately that it is almost impossible to say with which family it should be classed. Future discoveries will probably ere long render it impracticable to generically distinguish *Herpestes*, *Amphictis*, *Cynodictis*, and *Canis* from one another, or from the forms to which the names *Amphicynodon* and *Cynodon* have been applied.

In quite another direction Filhol[1] has indicated that in those forms of *Cynodictis* in which the last lower molar is absent there is a complete passage through *Stenoplesictis* to *Palæoprionodon* (*vide* Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pp. 67–8); while from the former the transition to the musteline genus *Plesictis* is gradual, and the latter is but slightly removed from the feline *Pseudælurus*.

Cynodictis lacustris, P. Gervais[2].

Syn. *C. mungoïdes* and *C. antiqua*, Bravard, MS.

Hab. France.

27572. Fragment of the left maxilla, containing m. 1, m. 2, and a portion of pm. 4; from the Upper Eocene of Apt (Vaucluse), France. These teeth, although more perfect, appear to be indistinguishable from the corresponding type specimens figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xxv. fig. 2; together with the next specimen, they are entered in Bravard's MS. Catalogue in the Museum as *C. mungoides*, Bravard[3].

Bravard Collection. Purchased, 1852.

27573. Portion of the left ramus of the mandible, containing the

[1] Ann. Sci. Géol. vol. viii. art. 1, p. 49, and Ann. Soc. Sci. Phys. Nat. Toulouse, *op. cit.*

[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 133 (1848–52). The present writer is unacquainted with the date of publication of this portion of the work.

[3] This name, together with the names *C. dubia* (*non* Filhol), *C. antiqua*, and *C. angustidens*, occurs in some (apparently) unpublished plates of Bravard's in the Museum, in which the specimens noticed above are figured.

last three premolars, the carnassial, and $\overline{\text{m. 2}}$; from the Upper Eocene of Apt. The dentition of this specimen appears to agree precisely with that of the mandible figured by P. Gervais (*op. cit.* fig. 1).

Bravard Collection. Purchased, 1852.

28122. Part of the right ramus of the mandible, showing the last three premolars; from the Upper Eocene of Apt. In this specimen $\overline{\text{pm. 4}}$ is rather larger than in No. 27573, and the ramus is somewhat deeper; it is, however, very doubtful if these differences can be considered more than individual characters. The present specimen is entered in Bravard's Catalogue as *C. antiqua*, Bravard.

Bravard Collection. Purchased, 1852.

28123. The greater portion of the right ramus of the mandible, containing the whole of the teeth in a damaged condition and the perfect lower carnassial of the opposite side; from the Upper Eocene of Apt. These specimens are precisely similar to No. 27573. *Bravard Collection. Purchased,* 1852.

28124. Detached teeth provisionally referred to this species; from the Upper Eocene of Apt.

Bravard Collection. Purchased, 1852.

Cynodictis crassidens, Filhol[1].

This is a large species, which, in the small size and backward position of the inner cusp of the lower carnassial and the low crown of its blade, connects the more Viverroid species (e.g. *C. compressidens*) with *Amphicyon* and *Canis*.

Hab. France.

M. 1664. The greater portion of the left ramus of the mandible, containing the second premolar, the carnassial, the second true molar, and the alveoli of the other cheek-teeth; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees precisely with the less perfect portion of the mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xvii. figs. 50, 51. The space occupied by the seven cheek-teeth is 0,070. *Purchased,* 1884.

M. 1661. Two specimens of the middle portion of the right ramus of the mandible, containing the second and third premolars and the carnassial; from the Upper Eocene of Bach.

Purchased, 1884.

[1] Bull. Soc. Philom. Paris, ser. 6, vol. xi. pp. 16–21 (1874).

M. 1662. Hinder portion of the left ramus of the mandible, showing the carnassial, m. 2, and the alveolus of m. 3, with the complete coronoid process; from the Upper Eocene of Bach. *Purchased*, 1884.

M. 1663. Fragment of the right ramus of the mandible, showing the second true molar; from the Upper Eocene of Bach. *Purchased*, 1884.

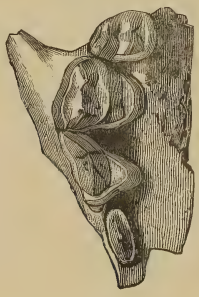
Cynodictis gryei, Filhol[1].

A large species, with "microdont" and "meionocreodont" dentition.

Hab. France.

M. 1368. (*Fig.*) Fragment of the left maxilla, containing the last four cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen (woodcut, fig. 14)

Fig. 14.



Cynodictis gryei, Filhol.—Fragment of the left maxilla; from the Upper Eocene of Caylux. ½.

agrees precisely with the type cranium figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xix. fig. 60, but shows m. 2, which is wanting in that specimen. This tooth is remarkable for the great development of its inner portion, and the extremely low elevation of the cusps on the crown. A similar character is presented by m. 3, and the carnassial is also remarkable for its antero-posterior shortness and great transverse breadth. In all these characters there is good evidence of the species belonging to a very primitive type. *Purchased*, 1884.

[1] Ann. Sci. Géol. vol. vii. art. 7, p. 74 (1876).

Cynodictis longirostris, Filhol[1].

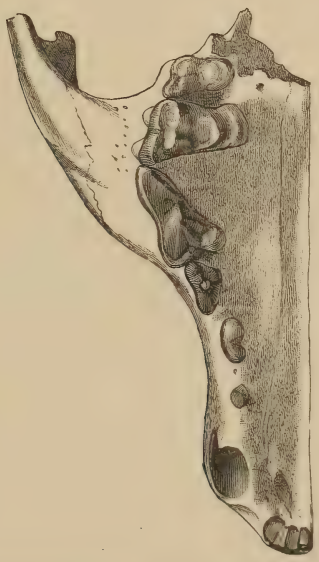
This species has been hitherto known only by the mandible, which is of an elongated form, and indicates a medium-sized species. The crown of the lower carnassial is comparatively low.

Hab. France.

M. 1665. Fragment of the right ramus of the mandible, containing $\overline{\text{m. 2}}$ and the alveolus of $\overline{\text{m. 3}}$, apparently belonging to this species; from the Upper Eocene of Bach, near Lalbenque (Lot), France. *Purchased*, 1884.

M. 1666. (*Fig.*) Anterior portion of the cranium of a *Cynodictis*; from the Upper Eocene of Bach. This specimen, of which the left half is figured, from the palatal aspect, in the accompanying woodcut (fig. 15), differs from the crania of any

Fig. 15.



Cynodictis longirostris (?).—Left half of the palate; from the Upper Eocene of Bach. ½.

species figured by Filhol. It agrees so well with the mandible of *C. longirostris* in size and general character that it may not improbably belong to that species, although, from the number of species of the genus described on the

[1] Ann. Sci. Géol. vol. iii. art. 7, p. 24 (1872).

evidence of the mandible, it is very difficult to make any certain determinations of the corresponding crania. The whole of the cheek-teeth are shown on the left side, and the first incisor of the same side is also *in situ*, the other teeth being represented merely by their alveoli. The first premolar is small and one-rooted, and is separated by a considerable interval from pm. 2, which is likewise small, and separated by an interval from pm. 3; the latter has a minute cusp on its posterior cutting-edge. The carnassial is a relatively short tooth, with a well-developed inner tubercle. The true molars are transversely elongated. The cranium seems not dissimilar in shape and size to that of *Cynodictis gryei* (Filhol, *op. cit.* vol. vii. pl. xix.); but the two are very readily distinguished by the different form of the teeth (compare woodcut, fig. 14). *Purchased*, 1884.

M. 1667. Anterior portion of the right ramus of the mandible, containing the third and fourth premolars and the alveolus of the canine; from the Upper Eocene of Bach.

Purchased, 1884.

Cynodictis compressidens, Filhol[1].

Syn. *Cynodictis angustidens*, Pomel and Bravard, MS. (?).

This is a medium-sized species, with relatively well-developed teeth, the cusps of the lower carnassial being very tall. In one race m. 2 is absent. The species has not hitherto been recorded from Vaucluse.

Hab. France.

M. 1352. The greater portion of the left ramus of the mandible; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen appears to agree precisely with the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxv. figs. 117–119, and shows part of the alveolus of the canine, the alveolus of pm. 1, the last three premolars, the first two true molars, and the alveolus of m. 3, which is of extremely minute size. *Purchased*, 1884.

M. 1353. The complete left ramus of the mandible, wanting the incisors, canines, pm. 1, pm. 3, pm. 4, and m. 3; from the Upper Eocene of Caylux. *Purchased*, 1884.

28128. Fragment of the right ramus of the mandible, containing pm. 3 and the anterior half of m. 1; from the Upper

[1] Ann. Sci. Géol. vol. iii. art. 7, p. 26 (1872).

Eocene of Apt (Vaucluse), France. This specimen appears to agree precisely with the last specimen ; it is entered in the Museum Register as *C. angustidens*, Pomel and Bravard. The present writer is unaware whether that name is merely a manuscript one, or whether it occurs in the memoir by those writers already mentioned under the head of the genus *Cynodictis* (p. 107) : if the latter should be the case, the name *angustidens* has the priority over *compressidens*.

Bravard Collection. Purchased, 1852.

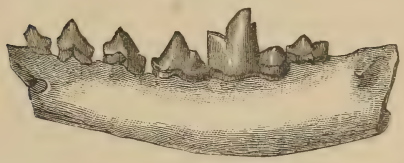
M. 1653. Two fragments of the mandible ; from the Upper Eocene of Bach, near Lalbenque (Lot), France. One specimen shows the three true molars, and the other the last premolar, the carnassial, and the alveoli of $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$.

Purchased, 1884.

Var. *viverroides*, Filhol[1].

M. 1359. The greater portion of the left ramus of the mandible, containing all the cheek-teeth, and part of the alveolus of the canine ; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen, which is figured in the accompanying woodcut (fig. 16), differs from the man-

Fig. 16.



Cynodictis compressidens, var. *viverroides*, Filhol.—Part of the left ramus of the mandible ; from the Upper Eocene of Caylux. ½.

dible of the type form by its slightly inferior size, by the absence of $\overline{\text{m. 3}}$, and by the slightly more backward position of the inner cusp of $\overline{\text{m. 1}}$, and in these respects agrees perfectly with the type mandible of the variety described by Filhol. This jaw presents a marked resemblance to that of *Herpestes*, but is distinguished by the relatively larger size of $\overline{\text{m. 2}}$ and of the hinder lobe of the blade of $\overline{\text{m. 1}}$; in the form of $\overline{\text{m. 2}}$ it comes very close to *Amphictis*.

Purchased, 1884.

[1] Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 56.

M. 1360. Fragment of the left ramus of the mandible, containing the four last cheek-teeth; from the Upper Eocene of Caylux. This specimen is precisely similar to the last.
Purchased, 1884.

M. 1654. The complete right ramus of the mandible, showing all the teeth, except the incisors, canine, and $\overline{\text{pm. 1}}$; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees precisely with the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxv. figs. 118, 119, with the exception of the absence of $\overline{\text{m. 3}}$.
Purchased, 1884.

M. 1655. Two specimens of the anterior portion of the ramus of the mandible, with the canines and premolars; from the Upper Eocene of Bach. These specimens are slightly smaller than the last; and it is uncertain whether they belong to the type form or the present variety.
Purchased, 1884.

M. 1367. Two portions of rami of the mandible; from the Upper Eocene of Caylux. These specimens agree very closely in size with the last. *Purchased*, 1884.

Cynodictis curvirostris, Filhol[1].

This species is of rather large size, and the crowns of the lower cheek-teeth are relatively low.
Hab. France.

M. 1660. Part of the right ramus of the mandible, containing the last premolar, the carnassial, and $\overline{\text{m. 2}}$, with the alveoli of the other teeth; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees precisely with the one figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xviii. figs. 52–54. *Purchased*, 1884.

Cynodictis brachyrostris, Filhol[2].

This species is nearly the same size as the last; but the mandible is much shorter.
Hab. France.

M. 1355. The nearly complete left ramus of the mandible; from the

[1] Ann. Sci. Géol. vol. vii. art. 7, p. 97 (1876).
[2] *Ibid.* . 71

Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen shows all the cheek-teeth, except $\overline{\text{pm. 1}}$, and appears to agree precisely with the type specimen figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxiv. fig. 102, in which the earlier premolars are wanting. It differs from the mandible of *C. compressidens* by the shorter $\overline{\text{pm. 4}}$, the longer $\overline{\text{m. 1}}$, and the larger $\overline{\text{m. 3}}$. *Purchased*, 1884.

Cynodictis intermedia, Filhol[1].

Hab. France.

M. 1356. The anterior portion of the cranium; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen, which wants the nasals, shows the two true molars and the last three premolars, as well as the alveoli of the remaining teeth. It apparently agrees precisely with the type cranium figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxiv. fig. 105[2]; and exhibits well the extreme shortness of the facial part and the great width of the zygomata, which are such characteristic features of the species. The teeth agree very closely with those of the type (Filhol, *op. cit.* fig. 104); but the inner portion of the true molars is rather shorter antero-posteriorly. In the sudden contraction in width immediately in advance of the carnassial, this cranium more nearly resembles some of the meionocreodont species of *Canis* (e.g. *C. bengalensis*) than *Viverra*; and in the extreme shortness of the face and palate is more like *Herpestes* than either of the other two genera. The cheek-teeth are, however, readily distinguished from those of existing species of *Herpestes* by the absence of the inner cusp of $\underline{\text{pm. 3}}$: the palatine foramina are of the elongated form of those of *Canis* and *Viverra*. *Purchased*, 1884.

Cynodictis boriei, Filhol[3].

A large species, with a remarkably meionocreodont dentition.

Hab. France.

M. 1652. Fragment of the left maxilla, containing the four last

[1] Ann. Sci. Géol. vol. vii. art. 7, p. 110 (1876).

[2] In the explanation of the plate, fig. 105 is given as *C. leptorhyncha* and fig. 106 as *C. intermedia*; marginal corrections made by M. Filhol in a copy presented to the writer indicate, however, that these names should be transposed.

[3] Bull. Soc. Philom. Paris, ser. 6, vol. x. p. 86 (1874).

cheek-teeth; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees very closely with the dentition of the cranium, figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xv. fig. 34; but the last molar is slightly narrower antero-posteriorly. *Purchased*, 1884.

M. 1357. The anterior portion of the left ramus of the mandible of a *Cynodictis*, not improbably belonging to the present species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen shows the canine, the four premolars, and the blade of the carnassial; and in the interval between the carnassial and the canine agrees very closely with the mandible of the smaller race of *C. boriei*, figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xvii. figs. 46–48; it apparently differs, however, in the greater relative height of the carnassial, which exceeds that of $\overline{\text{pm. 4}}$ [1]. *Purchased*, 1884.

Cynodictis dubia, Filhol [2].

Syn. (?) *Viverra leptorhyncha*, Filhol [3].

The typical form of this species is of medium size, and is distinguished by the lowness of the crown of the inferior carnassial, which does not exceed that of the last premolar [4]. As noticed below, it appears impossible to distinguish one variety from Filhol's so-called *Viverra leptorhyncha*, which is really more like *Amphictis* than *Viverra* proper, and whose resemblance to *Cynodictis* is noticed by Filhol.

Hab. France.

M. 1650. Part of the left ramus of the mandible, containing the canine, the last three premolars, and the carnassial; from the Upper Eocene of Bach, near Lalbenque (Lot), France. *Purchased*, 1884.

Variety.

M. 1651. (*Fig.*) The nearly complete right ramus of the mandible, containing the alveolus of the canine and all the cheek-teeth

[1] In his description of *Cynodictis dubia* (Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 48), Filhol mentions that that species is distinguished from all others by the circumstance that the lower carnassial is not higher than $\overline{\text{pm. 4}}$; it may be therefore that the figures of the mandible of *C. boriei* are erroneous in this respect.

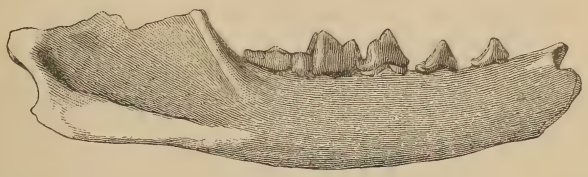
[2] Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 48, pl. vii. figs. 11, 13.

[3] Arch. Mus. Lyon, vol. iii. p. 69, pl. iv. figs. 16–19. The volume is dated 1883; but separate copies of this memoir are dated 1881.

[4] Filhol remarks that this feature is peculiar to the species; but it appears to obtain in *C. boriei* and others (*vide* note 1).

except $\overline{\text{pm. 1}}$; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. There is no trace of $\overline{\text{m. 3}}$ (of which a minute alveolus exists in the type specimen figured by Filhol, *op. cit.* fig. 13); but in all other respects the two specimens are precisely similar, with the exception that the present specimen (woodcut, fig. 17) is slightly larger.

Fig. 17.



Cynodictis dubia, Filhol, var.—Part of the right ramus of the mandible; from the Upper Eocene of Caylux. ½.

There do not seem any points by which the present specimen can be distinguished from the mandible of *Viverra leptorhyncha*, Filhol (Arch. Mus. Lyon, vol. iii. pl. iv. figs. 16, 17), in which only the last two teeth remain. The present form seems to be one of those generalized species of which the generic position is extremely doubtful.

Purchased, 1884.

Cynodictis leptorhyncha, Filhol[1].

This is a smaller species than the last, with the crown of the lower cheek-teeth slightly taller, but otherwise very similar. The last lower true molar is absent in one race.

Hab. France.

M. 1658. Part of the left ramus of the mandible, containing the canine, the alveoli of the first three premolars, the fourth premolar, the carnassial, and the alveoli of $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$, the latter very minute; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees very closely with the type mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xxi. figs. 73, 74.

Purchased, 1884.

Var. *viverroides*, Filhol[2].

M. 1656. Fragment of the right ramus of the mandible, containing the two last premolars, the carnassial, and $\overline{\text{m. 2}}$, with no

[1] Ann. Sci. Géol. vol. vii. art. 4, p. 124 (1876).

[2] Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 54.

trace of $\overline{\text{m. 3}}$; from the Upper Eocene of Bach. This specimen appears to agree very closely with the one figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. vi. figs. 3, 4. *Purchased*, 1884.

M. 1376. Part of the right ramus of the mandible, containing the two last premolars, the carnassial, and $\overline{\text{m. 2}}$, with no trace of $\overline{\text{m. 3}}$; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the last. *Purchased*, 1884.

M. 1367. Part of the left ramus of the mandible, containing the four premolars; from the Upper Eocene of Caylux. In this and the next specimen it is impossible to say whether $\overline{\text{m. 3}}$ was present. *Purchased*, 1884.

M. 1657. Part of the left ramus of the mandible, containing the last three premolars and the carnassial; from the Upper Eocene of Caylux. *Purchased*, 1884.

Cynodictis, sp.

Hab. France.

M. 1659. Fragment of the right ramus of the mandible, of smaller size than any of those referred to the last species, but agreeing in general characters, and wanting $\overline{\text{m. 3}}$; from the Upper Eocene of Bach, near Lalbenque (Lot), France. It is not improbable that this specimen may belong to a small race of *C. leptorhyncha*. *Purchased*, 1884.

Cynodictis (?), sp.

Hab. France.

M. 1354. Part of the left ramus of the mandible, showing the second and fourth premolars, and the three true molars, from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen appears to come nearest in form to *Cynodictis leptorhyncha*; but is readily distinguished by its much shorter form, and the lower crown of the carnassial, which is lower than that of $\overline{\text{pm. 4}}$. The inner cusp of $\overline{\text{m. 1}}$ is strongly developed and very distinct, and the talon short and wide; there is a cusp on the posterior border of $\overline{\text{pm. 4}}$. These characters distinguish the specimen from *Cynodon*. In *Amphicynodon*, Filhol [1], there is a similar cusp to $\overline{\text{pm. 4}}$, but the ascending ramus of the

[1] Ann. Sci. Géol. vol. xii. pl. viii. fig. 29.

jaw is nearly vertical, whereas it is oblique in the present specimen. It appears, on the whole, that the latter should probably be referred to the genus *Cynodictis*; and the lowness of the crown of the carnassial indicates that it is one of the least specialized forms. *Purchased*, 1884.

LIMB-BONES OF UNDETERMINED SPECIES OF CYNODICTIS OR ALLIED GENERA.

a. *From the Upper Eocene of Apt (Vaucluse), France.*

27574. The distal half of the right humerus; perhaps belonging to *C. lacustris*. *Bravard Collection. Purchased*, 1852.

28126. The distal extremity of a humerus.
Bravard Collection. Purchased, 1852.

28127. The proximal extremity of a right femur.
Bravard Collection. Purchased, 1852.

28121–2, 28129. Three specimens of metacarpals and metatarsals.
Bravard Collection. Purchased, 1852.

28125. The bones of the right manus, nearly complete.
Bravard Collection. Purchased, 1852.

b. *From the Upper Eocene of Caylux and Bach, France.* (*Purchased*, 1884.)

M. 1696. Three humeri, probably belonging to a medium-sized species. These bones agree with a specimen figured by Filhol in the Ann. Sci. Géol. vol. iii. pl. xviii. fig. 44, and provisionally referred to *C. compressidens*.

M. 1382. Three humeri, slightly smaller than the last.

M. 1697. Four humeri, considerably smaller than the last; and slightly larger than a specimen figured by Filhol (*op. cit.* fig. 45), and suggested to belong to *Viverra*.

M. 1384. A right humerus, considerably smaller than the last. This specimen is precisely similar to one figured by Filhol (*op. cit.* fig. 46). This and the preceding specimens have a well-developed entepicondylar foramen.

M. 1698. Seven ulnæ, of various sizes.

M. 1699. Five radii, of various sizes.

M. 1700. Several calcanea, of various sizes.

M. 1701. Several astragali, of various sizes.

M. 1702–3. Numerous metapodial bones, of various sizes.

M. 1704. Four specimens of the axis vertebra; and a fifth apparently belonging to a distinct species.

M. 1705. Two specimens of the sacrum.

M. 1706. Numerous caudal vertebræ.

M. 1412. Numerous limb-bones.

M. 1380. Numerous canine teeth.

M. 1707. Ditto.

Genus **ICTICYON**, Lund[1].

Syn. *Speothos*, Lund[2].

Dentition (usually) :—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$. In a recent female specimen of *I. venaticus* in the Museum of the Royal College of Surgeons (No. 533) a small $\underline{\text{m. 2}}$ is present; and in a large recent male skull in the British Museum $\overline{\text{m. 2}}$ is absent on both sides; the range of variation in the number of true molars is therefore $\frac{(1—2)}{(1—2)}$. In its dentition this genus is the most specialized of the *Caninæ*; this being shown by the suppression of the hinder molars, and by the absence of the inner cusp of the lower carnassial. In a lineal classification it is impossible to assign a satisfactory position to the genus, since it is necessary that *Cynodictis* should be placed next to the *Viverridæ*, and *Canis* close to *Amphicyon*, which comes next to *Dinocyon* and *Hyænarctos*.

Icticyon venaticus, Lund[3].

Syn. *Cynogale venatica*, Lund[4].
(?) *Speothos pacivorus*, Lund[5].
Icticyon affinis venaticus, Lund[6].
(?) *Icticyon major*, Lund[7].

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[1] K. Danske Vid. Selsk. Skr. vol. xi. p. 62 (1845).

[2] *Ibid.* vol. viii. p. 93, pl. xix. figs. 1, 2 (1841). The probable generic identity of *Speothos* with *Icticyon* has been indicated by Huxley (Proc. Zool. Soc. 1880, p. 280); the former name has the priority. The same remark applies to the specific names *pacivorus* and *venaticus*.

[3] *Ibid.* vol. ix. p. 201 (1842), *Cynogale*.

[4] *Loc. cit.*

[5] *Ibid.* vol. viii. p. 93 (1841).

[6] *Vide* H. Gervais and Ameghino, 'Mammifères fossiles de l'Amérique du Sud,' p. 35 (1880).

[7] *Ibid.*

A comparison of the specimens mentioned below with specimens of the existing form shows that the only difference that can be detected between the two is that the teeth of the fossil are slightly narrower. Judging from Lund's figures it seems very doubtful if the so-called *Speothos pacivorus* and *Icticyon major* (described from a single tooth) can be regarded as more than large races of the present species.

Hab. S. America.

18911. The hinder portion of the cranium; from a cavern in Minas Geraes, Brazil. *Claussen Collection.* *Purchased*, 1845.

18911 a. Fragment of the left maxilla, containing the four premolars and the true molar; from a cavern in Minas Geraes. It is noteworthy that this and other fossil specimens show no trace of m. 2.
Claussen Collection. *Purchased*, 1845.

18911 b. Fragment of the right maxilla, containing pm. 4 and m. 1; from a cavern in Minas Geraes.
Claussen Collection. *Purchased*, 1845.

18911 c. Fragment of the premaxillæ, containing the outer incisors; from a cavern in Minas Geraes.
Claussen Collection. *Purchased*, 1845.

18911 d. Fragment of the mandible, containing the canines of both sides, and the last three premolars and m. 1 of the left side; from a cavern in Minas Geraes.
Claussen Collection. *Purchased*, 1845.

18911 e. Hinder part of the left ramus of the mandible, containing the last two premolars, the carnassial, and the alveolus of m. 2; from a cavern in Minas Geraes.
Claussen Collection. *Purchased*, 1845.

18911 f. The greater part of the right ramus of the mandible, containing the whole of the cheek-dentition; from a cavern in Minas Geraes.
Claussen Collection. *Purchased*, 1845.

Genus **LYCAON**, Brookes[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$. The lower dentition differs from that of *Canis* by the presence of an anterior talon, or cusp, to pm. 4.

[1] In Griffith's Animal Kingdom, vol. v. p. 151 (1827).

Lycaon anglicus, Lydekker[1].

Hab. England.

40950. (*Fig.*) The greater portion of the left ramus of the mandible, containing the four premolars and the carnassial, with the alveoli of the incisors, canine, and $\overline{m.2}$; from the cave of Spritsail-Tor, Gower, Glamorganshire[2]. This specimen was described by Falconer in a manuscript note, which has been published in his 'Palæontological Memoirs,' vol. ii. p. 462, under the name of "Hyænoid Wolf," and full measurements are given. Two small-size figures are given in plate xxxvi. figs. 1, 2 of the same volume. The length of the cheek-teeth is somewhat in excess of that of average-sized specimens of *Canis lupus*, and is very considerably greater than in *Lycaon pictus*. The carnassial corresponds very closely with that of *C. lupus*, and has a wider talon than in *L. pictus*: this tooth conclusively proves the canoid nature of the specimen. The fourth premolar is a very remarkable tooth, being relatively much wider than the corresponding tooth of *C. lupus* or *L. pictus*. It agrees with the latter, and differs from the former (and that of all species of *Canis*) by the presence of a distinct anterior talon. The second and third premolars are also relatively wider than in *Canis lupus* or *Lycaon pictus*, and have a trace of a minute anterior talon, which is generally more or less distinctly developed in the latter. The first premolar does not present any noteworthy characters.

There is no question but that the specimen is specifically distinct both from *Canis lupus* and *Lycaon pictus*. The form of the fourth premolar being nearer to the corresponding tooth of the latter than to that of the former, it has appeared advisable to refer the specimen provisionally to the genus *Lycaon*, with the specific name of *anglicus*. The relatively great width of $\overline{pm.4}$ seems to indicate affinity with some of the more generalized species of *Hyæna*, like *H. macrostoma*.

Presented by Gen. Wood, 1865.

[1] Geol. Mag. dec. 3, vol. i. p. 443 (1884).

[2] For the position of this cave see 'Falconer's Palæontological Memoirs,' vol. ii. p. 522.

Genus **CANIS**, Linn.[1]

Following Flower's classification this genus is taken to include all the existing Canoids, with the exception of *Lycaon*, *Icticyon*, and *Otocyon*; it also includes the fossil genera *Galecynus*, Owen, and *Lycorus*, Bourguignat.

Dentition.—In typical forms the dental formula is I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$; in some aberrant forms (*Cyon*), however, the true molars are $\frac{2}{2}$; and in the fossil *C.* (*Lycorus*) *nemestrinus* the premolars are reduced to $\frac{4}{3}$. The formula embracing this range of variation[2] will be I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{(3-4)}$, M. $\frac{2}{(2-3)}$. There is a great amount of variation in the relative proportions of the different cheek-teeth; and in the degree of development and position of the inner cusp of the lower carnassial[3]. There is no entepicondylar foramen to the humerus.

Canis lupus, Linn.[4]

Syn. *Canis spelæus*, Goldfuss[5].
Lupus spelæus, Blainville[6].
Canis juvillacus, Blainville[7] (*ex* Bravard).

Hab. Europe and North Asia.

44739. Cranium and mandible, wanting several teeth; from Hutton Cave, Somersetshire. This specimen is remarkable for the circumstance that the first upper premolar of the left side (of which the anterior half is broken away) is of an elongated form like $\underline{\text{pm. 2}}$, and is inserted by two distinct fangs. The first three premolars are in contact with one another. In the mandible $\overline{\text{pm. 1}}$ has only a single root; but the three preceding teeth are relatively long, and are in contact with one another.

Presented by B. Bright, Esq., 1874.

[1] Syst. Nat. ed. 12. vol. i. p. 56 (1766).

[2] In *C. cancrivorus* the molars are $\frac{(2-3)}{(3-4)}$; and Filhol has shown that in the long-jawed domestic races like the greyhound $\underline{\text{m 3.}}$ is occasionally present, while in the short-jawed races like the bull-dog $\underline{\text{m. 3}}$ is sometimes absent.

[3] For a full account of these variations, see Huxley, Proc. Zool. Soc. 1880, p. 238 *et seq.*, and the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 240 *et seq.*

[4] Syst. Nat. ed. 12, vol. i. p. 50 (1766).

[5] Nov. Acta Ac. Cæs. Leop.-Car. vol. x. pt. 2, p. 456 (1823).

[6] Ostéographie, genus *Canis*, p. 101 (1841?).

[7] *Ibid.* pp. 125–6.

M. 404. Greater portion of the cranium, showing all the cheek-teeth; from Banwell Cave, Somersetshire.
Egerton Collection. *Purchased*, 1882.

M. 404 a. Hinder portion of a small cranium; from Banwell Cave.
Egerton Collection. *Purchased*, 1882.

38144. The nearly complete cranium and mandible; from the Pleistocene of Bernburg, Germany. This is a very typical specimen. *Purchased*, 1864.

M. 404 b. Fragment of the right maxilla, containing the last three cheek-teeth and the alveolus of pm. 3; from the Gailenreuth Cave, Franconia. The teeth of this specimen are in beautiful preservation, and are of very large size.
Egerton Collection. *Purchased*, 1882.

M. 223. Fragment of the left maxilla, containing the four last cheek-teeth; from Banwell Cave.
Egerton Collection. *Purchased*, 1882.

M. 403. The greater part of the right maxilla, containing the three last cheek-teeth; from Banwell Cave.
Egerton Collection. *Purchased*, 1882.

M. 437. Fragment of the right maxilla, containing pm. 4 and m. 1; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

24 (O. C.). Fragment of the left maxilla, containing pm. 4 and m. 1; probably from the Gailenreuth Cave.
Sömmering Collection. *Purchased*, 1827.

28582. Fragment of the right maxilla, showing pm. 4 and m. 2; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28571. The complete left ramus of the mandible, wanting the first incisor and the canine; from a cavern in Sundwig.
Purchased, 1853.

23 (O. C.). Part of the left ramus of the mandible, with the cheek-teeth; from the Gailenreuth Cave.
Sömmering Collection. *Purchased*, 1827.

15636. The greater part of the right ramus of the mandible, showing the canine and all the cheek-teeth except m. 3; from Kent's-Hole Cavern, Torquay.
McEnery Collection. *Purchased*, 1842.

28572. The complete mandible, wanting all the teeth except m. 1 and m. 2; from a cavern in Sundwig. *Purchased*, 1853.

M. 223 a. Part of the left ramus of the mandible, containing the four premolars and the carnassial; from Banwell Cave.
Enniskillen Collection. Purchased, 1882.

46981. The greater portion of the right ramus of the mandible, containing all the cheek-teeth except $\overline{\text{pm. 1}}$ and $\overline{\text{m. 3}}$; from the cavernous fissures of Oreston, near Plymouth.
Purchased, 1876.

23140. Fragment of the left ramus of the mandible, containing the last three premolars and the carnassial; from the Pleistocene of Grays, Essex. *Purchased*, 1849.

28056. Fragment of the left ramus of the mandible, containing the canine and the four premolars; from the Pleistocene of Westeregelen, near Magdeburg, Saxony.
Presented by J. Brown, Esq., 1852.

28056. Fragment of the left ramus of the mandible, containing the canine and the two middle premolars; from the Pleistocene of Westeregelen. *Presented by J. Brown, Esq.*, 1852.

M. 403 a. The greater part of the left ramus of the mandible, containing all the cheek-teeth except $\overline{\text{m. 3}}$; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

M. 403 b. Fragment of the right ramus of the mandible, containing the unworn carnassial; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

M. 403 c. Fragment of the left ramus of the mandible, containing the canine, $\overline{\text{pm. 1}}$, and $\overline{\text{pm. 2}}$; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

M. 404 c. The complete right ramus of the mandible, wanting two incisors and $\overline{\text{m. 3}}$; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

M. 403 d. Fragment of the left ramus of the mandible, containing $\overline{\text{m. 1}}$ and $\overline{\text{m. 2}}$; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

23732. Fragment of the right ramus of the mandible, containing $\overline{\text{pm. 2}}$, $\overline{\text{pm. 3}}$, and the blade of $\overline{\text{m. 1}}$; from the Pleistocene of Slade Green, near Erith, Kent. *Purchased*, 1849.

28573. The hinder part of the left ramus of the mandible, con-

taining the two last premolars and the first molar; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

M. 436. Portion of the left ramus of the mandible, containing four cheek-teeth; from a cavern in Sundwig.
Enniskillen Collection. Purchased, 1882.

M. 404 d. Part of the right ramus of the mandible, showing all the cheek-teeth except $\overline{\text{pm. 1}}$ and $\overline{\text{m. 3}}$; from Banwell Cave.
Egerton Collection. Purchased, 1882.

M. 404 e. Part of the left ramus of the mandible, showing the four premolars and the carnassial; from Banwell Cave.
Egerton Collection. Purchased, 1882.

28570. The greater portion of the mandible, containing several teeth in a much-worn condition; from a cavern in Sundwig. *Purchased*, 1853.

28872. The left ramus of the mandible, containing all the teeth except the incisors and the last molar; from the Pleistocene of Tour-de-Boulade (Puy-de-Dôme), France. This specimen, together with the others from the same locality, is the type of Bravard's *Canis juvillacus* (*vide* De Blainville, 'Ostéographie,' genus *Canis*, pp. 125–6); but it does not appear to differ in any respect from typical mandibles of *Canis lupus*. *Bravard Collection. Purchased*, 1852.

28873. The right ramus of the mandible, wanting the two inner incisors and $\overline{\text{pm. 1}}$; from the Pleistocene of Tour-de-Boulade. *Bravard Collection. Purchased*, 1852.

28870. Greater portion of the left ramus of the mandible, in a much-broken condition; from the Pleistocene of Tour-de-Boulade. *Bravard Collection. Purchased*, 1852.

28871. Greater portion of the right ramus of the mandible, in a much-broken condition; from the Pleistocene of Tour-de-Boulade. *Bravard Collection. Purchased*, 1852.

27625. Greater portion of the right ramus of the mandible, with the teeth much broken, and a fragment of the scapula and ulna; from the Pleistocene of Vic-le-Conte, near Issoire (Puy-de-Dôme), France.
Croizet Collection. Purchased, 1848.

29699. Fragment of the right ramus of the mandible, containing

the broken canine, the alveoli of the three first premolars, and the complete $\overline{\text{pm. 4}}$. *Purchased*, 1853.

23141. The germ of the right lower carnassial; from the Pleistocene of Grays, Essex. *Purchased*, 1849.

18982. The left lower carnassial; from the Pleistocene of Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

M. 213. Two humeri; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 215. A left ulna; from the Gailenreuth Cave.
Enniskillen Collection.

M. 218. A left radius; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

28875. The distal half of the right humerus; from Tour-de-Boulade, Puy-de-Dôme. This and other limb-bones from the same locality are referred by Bravard to his *Canis juvillacus*.
Bravard Collection. Purchased, 1852.

40714. The proximal half of the right femur; from Banwell Cave, Somersetshire. *Purchased*, 1867.

M. 219. The right tibia, imperfect at the proximal extremity; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

28876. The left tibia; from the Pleistocene of Tour-de-Boulade.
Bravard Collection. Purchased, 1852.

28877. The left astragalus; from the Pleistocene of Tour-de-Boulade.
Bravard Collection. Purchased, 1852.

M. 214, 216, 217, 222. Various limb-bones; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 403. Numerous limb-bones and vertebræ; from the Gailenreuth Cave. *Egerton Collection. Purchased*, 1882.

46137. An atlas vertebra, of large size; dredged off the eastern coast of England (Pleistocene).
Owles Collection. Purchased, 1874.

46138. A lumbar vertebra, of large size; dredged off the eastern coast of England. *Owles Collection. Purchased*, 1874.

18831. The third cervical vertebra; from the Pleistocene of Grays, Essex. *Purchased*, 1845.

28874. The sixth cervical vertebra; from the Pleistocene of Tour-de-Boulade, Puy-de-Dôme.
Bravard Collection. Purchased, 1852.

37190. A dorsal vertebra; from Brixham Cave, near Torquay.
Presented by R. W. Wolston, Esq., 1863.

37189. The sacrum; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

M. 210–11. Numerous vertebræ; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

M. 285. The axis vertebra; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

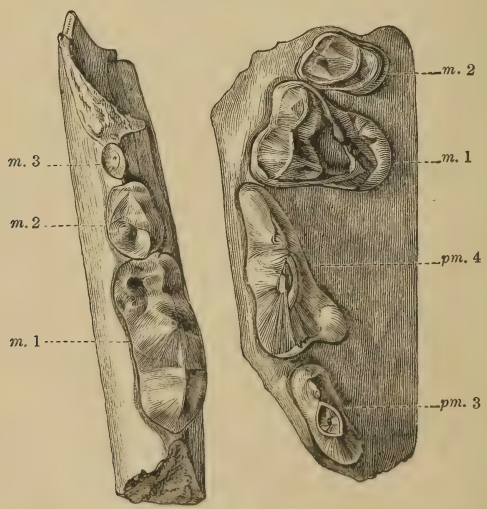
M. 372. A proximal phalangeal; from the Gailenreuth Cave.
Egerton Collection. Purchased, 1882.

Canis cautleyi, Bose[1].

Hab. India.

40182. The hinder portion of the left ramus of the mandible, con- (*Fig.*)

Fig. 18.



Canis cautleyi.—Part of the left ramus of the mandible (A) and the left side of the palate (B); from the Siwalik Hills. Dublin Museum. ¼. (From the 'Palæontologia Indica.')

[1] Quart. Journ. Geol. Soc. vol. xxxvi. p. 135 (1880).

taining the three true molars, the last of which is of very small size; from the Pliocene of the Siwalik Hills, India. This specimen, with the next, is the type of the species, and is described and figured by Bose in the Quart. Journ. Geol. Soc. vol. xxxvi. p. 135, pl. vi. figs. 7, 8. It is also described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 259, pl. xxxii. figs. 6, 6*a*. The accompanying woodcut (fig. 18) shows the hinder cheek-dentition of a skull of this species, in the Museum of Science and Art, Dublin, from the Siwalik Hills. The carnassial teeth are relatively longer than in the existing Wolves of the Old World.

Cautley Collection. Presented, 1842

40181. (*Fig.*) Fragment of the left ramus of the mandible, containing the first two true molars and the alveolus of m. 3; from the Pliocene of the Siwalik Hills. This specimen, in which the summit of the hinder lobe of the blade is broken off, is described and figured by Bose in the memoir quoted above (pl. vi. fig. 9). *Cautley Collection. Presented*, 1842.

15918. The left upper carnassial; from the Pliocene of the Siwalik Hills. *Cautley Collection. Presented*, 1842

15920. The associated bones of the hind foot of a Carnivore; from the Pliocene of the Siwalik Hills. These bones agree with those of *Canis lupus*, but are of rather smaller size; they may very probably belong to the present species.

Cautley Collection. Presented, 1842.

Canis, sp.

Hab. Brazil.

M. 24. Two fragments of the maxillæ of opposite sides; from a deposit called "Tipitata," in the neighbourhood of San Angelo, 10 miles from the city of Mexico. These specimens indicate an animal of the size of *C. lupus*, but with a larger pm. 1; they are too much damaged for specific determination. *Presented by P. Geddes, Esq.*, 1880.

Canis, sp. (allied to *C. aureus*, Linn.).

Hab. India.

15921. (*Fig.*) Fragment of the right maxilla, containing pm. 4 and m. 1, and the alveolus of pm. 3; from the Pliocene of the Siwalik

Hills, India. This specimen has been described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 264, pl. xxxii. fig. 2.

Cautley Collection. *Presented*, 1842.

Canis neschersensis, Blainville[1] (*ex* Croizet).

Syn. *Lupus neschersensis,* Bourguignat[2].

Hab. France.

28877. Cast of the left ramus of the mandible, containing the canine and all the cheek-teeth except pm. 1 and m. 3. The original of this specimen is from the Pliocene of Neschers, France, and is described and figured by De Blainville in his 'Ostéographie,' genus *Canis*, p. 125, pl. xiii. It indicates a species intermediate in size between the Wolf and the Jackal. *Bravard Collection.* *Purchased*, 1852.

27620. The left upper carnassial; from the Pliocene of Neschers, France. *Croizet Collection.* *Purchased*, 1848.

27620 a. The associated left upper true molar; from the Pliocene of De-la-Grave, France. *Croizet Collection.* *Purchased*, 1848.

28878. The distal extremity of the tibia; from the Pliocene of Neschers. *Bravard Collection.* *Purchased*, 1852.

Canis, sp.

Hab. Italy.

M. 415. A fragment of the right maxilla, containing pm. 3 and the anterior part of pm. 4, and a detached canine; from the Pliocene of the Val d'Arno, Italy. It is highly probable that these specimens belong either to *Canis etruscus* or *C. falconeri* of Forsyth Major.

Egerton Collection. *Purchased*, 1882.

Canis vulpes, Linn.[3]

Syn. *Vulpes vulgaris,* Owen[4] (*ex* Brisson).
Vulpes major, Schmerling[5].

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[1] Ostéographie, genus *Canis*, p. 125 (1841?).
[2] Ann. Sci. Géol. vol. vi. art. 6, p. 45 (1875).
[3] Syst. Nat. ed. 12, vol. i. p. 59 (1766).
[4] Brit. Foss. Mamm. and Birds, p. 134 (1846).
[5] Recherches Ossemens Fossiles de Liége, vol. ii. p. 39 (1834).

Vulpes minor, Schmerling[1].
Canis vulpes fossilis, Pomel[2].
Canis spelæus minor, Wagner[3].

An imperfect cranium has recently been described by the present writer (Geol. Mag. dec. 3, vol. ii. p. 443), from the Red Crag of Boyton, Suffolk (woodcut, fig. 19), which is indistinguishable from

Fig. 19.

Canis vulpes.—Right half of the palate; from the Red Crag of Boyton, Suffolk. ½

crania of the present species, with the exception of its superior size. If, as seems probable, the specimen is really contemporary with the Crag, it is the earliest recorded occurrence of the species.

Hab. Europe.

M. 225. The palate; from Hutton Cave, Somersetshire.
Enniskillen Collection. Purchased, 1882.

[1] Recherches Ossemens Fossiles de Liége, vol. ii. p. 39 (1834).
[2] Catalogue Méthodique, p. 69 (1853).
[3] Archiv für Natur. vol. xv. p. 17, *teste* Owen.

48901. Part of the left maxilla, containing all the cheek-teeth except pm. 1; from Brixham Cave, near Torquay.
Brixham-Cave Collection. Presented, 1876.

M. 406. Anterior portion of the cranium, showing the hinder cheek-teeth of the right side; from a cavern in the Mendip Hills. *Egerton Collection. Purchased*, 1882.

M. 406 a. Anterior portion of the cranium, showing the last four cheek-teeth of the left side; from a cavern in the Mendip Hills. *Egerton Collection. Purchased*, 1882.

M. 226. The left ramus of the mandible, showing five cheek-teeth; from Hutton Cave, Somersetshire.
Enniskillen Collection. Purchased, 1882.

41667. The mandible and the upper dentition; from the Pleistocene of Dartford, Kent.
Toulmin-Smith Collection. Purchased, 1867.

55 (O. C.). The right ramus of the mandible, containing the canine and all the cheek-teeth; from Kirkdale Cave, Yorkshire.
Presented by W. Salmond, Esq. Before 1836.

35681. Fragment of the right ramus of the mandible, showing m. 1 and m. 2; from Kirkdale Cave.
Bean Collection. Purchased, 1859.

38495. Part of the right ramus of the mandible, showing all the cheek-teeth except pm. 2 and m. 3; from the Pleistocene of Grays, Essex. *Purchased*, 1864.

28574. The mandible, showing all the teeth except the incisors and the last molar; from a cavern in Sundwig, Westphalia. This specimen is of very large size. *Purchased*, 1853.

27 (O. C.). The right ramus of the mandible, wanting all the teeth except m. 2; from a cavern in Sundwig, Westphalia.
Sömmering Collection. Purchased, 1827.

17936. The right ramus of the mandible, showing pm. 2, pm. 3, m. 1, and m. 2; from Kent's-Hole Cavern, Torquay.
McEnery Collection. Purchased, 1842.

M. 94. The right ramus of the mandible of a very old individual, wanting pm. 1 (of which the alveolus has disappeared) and m. 2. From Cat's-Hole Cave, Gower, Glamorganshire.
Presented by Gen. Wood, 1865.

18982. Two broken rami of the mandible, from Kent's-Hole Cavern.
Presented by Rev. Upton Richards, 1845.

37187. The two upper true molars of the left side; from Brixham Cave, near Torquay.
Presented by R. W. Wolston, Esq., 1863.

37188. Part of the left ramus of the mandible, containing the last three premolars and the carnassial; from Brixham Cave.
Presented by R. W. Wolston, Esq., 1863.

16712. (*Fig.*) Anterior portion of the left ramus of the mandible, containing the canine, the two last premolars, and the canine; from Kent's-Hole Cavern. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 134, fig. 51. *McEnery Collection. Purchased*, 1842.

16707. (*Fig.*) Hinder portion of the left ramus of the mandible, containing the carnassial, $\overline{\text{m. 2}}$, and the alveolus of $\overline{\text{m. 3}}$; from Kent's-Hole Cavern. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 137, fig. 53.
McEnery Collection. Purchased, 1842.

16727. Fragment of the right ramus of the mandible, containing the last three premolars and the carnassial; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

18236. (*Fig.*) Fragment of the right ramus of the mandible, containing $\overline{\text{m. 2}}$ and the alveolus of $\overline{\text{m. 3}}$; from the Pleistocene of Bacton, Norfolk. This specimen is figured by Newton in the Memoirs of the Geological Survey of England, "Vertebrata of the Forest-bed Series," pl. iv. figs. 2, 2 *a*, and is noticed in the Geol. Mag. dec. 2, vol. vii. p. 153 (1880)[1]. *Green Collection. Purchased*, 1843.

48902. The right ramus of the mandible; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

48907. The lower cheek-teeth of the right side, in a fragment of one side of the ramus of the mandible; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

16757–8. Two specimens of the distal half of the humerus and the left ulna; from Kent's Hole Cavern.
McEnery Collection. Purchased, 1842.

[1] Mr. Newton has some doubt whether this specimen may not belong to a small Dog; it seems, however, most probable that it really belongs to a Fox.

40948. The left ulna; from a cavern at Gower, Glamorganshire.
Presented by Gen. Wood, 1836.

48903. The left innominate; from Brixham Cave.
Brixham-Cave Collection. Presented, 1876.

16757 b, 16758 a. Two specimens of the femur, one broken; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

16757 a, 16758 b. Two specimens of the tibia, one broken; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

44922. Part of the shaft of the right tibia of a small Carnivore of the size of the Common Fox; from the Pleistocene of Ilford, Essex. This specimen is No. A*1 of Davies's 'Catalogue of the Brady Collection' (1874), where it is provisionally referred to the present species.
Brady Collection. Purchased, 1878.

Canis, sp.

Hab. Brazil.

18893. Fragment of the right maxilla, containing pm. 4 and the two true molars, and a portion of the mandible containing $\overline{\text{m. 1}}$, $\overline{\text{m. 2}}$; from a cavern in Minas Geraes, Brazil. In size these specimens agree very closely with *C. cancrivorus*; but they differ by the presence of an additional cusp in m. 2 between the two main cusps of the anterior side, and another extra cusp in $\overline{\text{m. 2}}$, situated on the inner border behind the first main cusp; this tooth is also relatively wider and has a more distinct cingulum. This specimen does not appear to come so near to any other existing American species of the genus. The occurrence of *Canis cancrivorus* in the fossil state is not mentioned by P. Gervais and Ameghino in their Catalogue of the Fossil Mammals of S. America.
Claussen Collection. Purchased, 1845.

Canis, sp.

Hab. Brazil.

18916. Fragment of the right ramus of the mandible, belonging to a species rather smaller than the last; from a cavern in Minas Geraes, Brazil. The second true molar wants the accessory cusp on the inner side, and has not such a distinct main cusp as in the last specimen. The present

specimen is too incomplete to determine whether it is specifically the same as one of the living species.
Claussen Collection. Purchased, 1845.

18911. Numerous canines of an undetermined Canoid; from the caverns of Brazil. *Claussen Collection. Purchased*, 1845.

Canis curvipalatus, Bose [1].

Hab. India.

37149. (*Fig.*) The associated cranium and mandible; from the Pliocene of the Siwalik Hills, India. This specimen, which is the type of the species, is described and figured by Baker and Durand in the Journ. As. Soc. Bengal, vol. v. pl. xxxvii. figs. 9–12; it is also described by Bose in the passage cited; and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 254, pl. xxxii. figs. 1, 1*a*, 7. It exhibits some very curious points of affinity with the South-African genus *Otocyon*.
Cautley Collection. Presented, 1842.

15919. Five associated limb-bones, comprising the two femora, the tibia, astragalus, and calcaneum; from the Pliocene of the Siwalik Hills. These bones are somewhat smaller than those of *C. vulpes*, and on this account might well belong to the present species. *Cautley Collection. Presented*, 1842.

15913. The distal two-thirds of the right tibia; from the Pliocene of the Siwalik Hills. This specimen agrees with the corresponding bone of the specimens under the last number.
Cautley Collection. Presented, 1842.

Canis palustris, H. von Meyer [2].

Syn. *Galecynus œningensis*, Owen [3].

Hab. Switzerland.

27402. (*Fig.*) Complete skeleton; from the Upper Miocene of Œningen, Switzerland. This specimen, which is the type of the species, and of the genus *Galecynus*, Owen, was originally described and figured by Murchison and Mantell in the

[1] Quart. Journ. Geol. Soc. vol. xxxvi. p. 134 (1880).

[2] Neues Jahrb. 1843, p. 701.

[3] Quart. Journ. Geol. Soc. vol. iii. p. 55, figs. 1, 3, 5 (1847, read 1846). Owen supersedes Meyer's name *palustris* from the circumstance that Blainville had previously referred to the specimen as *Vulpe d'Œningen*.

Trans. Geol. Soc. vol. iii. p. 277, pls. xxxiii.–iv., under the name of *Canis vulpes*. It was subsequently described and figured by H. von Meyer in the 'Fauna der Vorwelt,' pt. i. p. 4, pl. i. (1845), under the name of *Canis palustris*, and finally by Owen (*loc. cit.*) under the name of *Galecynus œningensis*. Huxley has shown in the Proc. Zool. Soc. 1880, p. 280, that there seems no valid reason why it should be separated generically from *Canis*.

Presented by Sir R. I. Murchison, Bart., K.C.B., 1852.

Canis ?, sp.

Hab. France.

M. 1708. Three humeri, about equal in size to the humerus of *Canis aureus*; from the Upper Eocene of Bach, near Lalbenque (Lot), France. These bones differ from the humerus of *Cynodictis*, *Cephalogale*, and *Amphicyon* in the absence of an entepicondylar foramen, and thereby agree with *Canis*. They probably indicate the existence of a species of that genus in the phosphorites, and would therefore seem to confirm the generic reference of the so-called *Canis filholi* and *C. cadurcensis*. *Purchased*, 1884.

M. 1709. Four specimens of the femur, agreeing fairly well in relative size with the last specimen, and coming from the same locality. They may possibly belong to the same species. *Purchased*, 1884.

Genus **AMPHICYON**, Lartet[1].

Syn. *Agnotherium*, Kaup (*in parte*).
Cynelos, Jourdan (MS.).
Pseudocyon, Lartet.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{3}{3}$.

Amphicyon giganteus, Laurillard[2].

Syn. *Canis d'une taille gigantesque*, Cuvier.

This is the largest species of the genus.
Hab. Europe.

[1] Comptes Rendus, vol. v. p. 424 (1837). The name *Agnotherium* was applied by Kaup (Oss. Foss. de Darmstadt, pt. ii.) in 1833, and has therefore the priority over *Amphicyon*; but the latter has obtained universal acceptation.

[2] Dict. Univ. d'Histoire Naturelle, vol. iii. p. 567 (1849).

15542 a. Cast of the first left upper true molar. The original, which is the type of the species, and is believed to be in the Paris Museum, is from the Lower Miocene of Avaray (Loir-et-Cher), France; and is figured by Cuvier in pl. cxciii. fig. 20 of the 4th ed. of the 'Ossemens Fossiles;' it is also figured by De Blainville in the 'Ostéographie,' genus *Subursus*, pl. xiv., under the name of *Amphicyon*, d'Avaray; De Blainville was inclined to consider it as a variety of *A. major*. *Purchased.*

Amphicyon major, Blainville [1].

Syn. *Amphicyon crassidens*, Pomel.
Amphicyon laurillardi, Pomel.
Amphicyon minor, Blainville (*in parte*).
(?) *Pseudocyon sansaniensis*, Lartet.

This species is as large as a Brown Bear.
Hab. France.

29615. Cast of the left maxilla and premaxilla, showing the canine, pm. 1, pm. 4, m. 1, and m. 2. The original of this specimen, which is the type, is preserved in the Paris Museum, and was obtained from the Middle Miocene of Sansan (Gers), France. It is figured by De Blainville in the 'Ostéographie,' genus *Subursus*, pl. xiv.
Hastings Collection. Purchased, 1855.

28150. The first left upper true molar (wanting a part of the outer half), and the anterior part of the left lower carnassial, both in a well-worn condition, and probably associated; from the Middle Miocene of Sansan.
Bravard Collection. Purchased, 1852.

29616. Cast of the distal half of the left humerus, wanting the bridge over the entepicondylar foramen. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

[1] 'Ostéographie,' genus *Subursus*, p. 78, pls. xiv., xv. (1841). Pomel (Cat. Méth. p. 72) divided Blainville's *A. major* into the two species *A. laurillardi* and *A. cultridens*. As, however, he did not give figures or clear definitions it is better, with Prof. Peters, to retain all the specimens figured by Blainville under the name of *A. major*, which has the priority over Pomel's names; the Sansan specimens indicate, however, a large and a small race. The lower jaw from Monte Bamboli, figured by Meneghini under the name of *A. laurillardi* (Atti. Soc. Ital. Sci. Nat. vol. iv. pl. ii.A.), has been referred by Gervais (Zool. et Pal. Générales, ser. 2, p. 22 [1876] to a new species of *Hyænarctos*. Pomel referred *Pseudocyon sansaniensis*, Lart., to his *A. laurillardi*; a reference which is provisionally followed here.

29617. Cast of the right radius. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

29618. Cast of the third left metacarpal. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

29619. Cast of the left tibia. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

29620. Cast of the right calcaneum. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

29621. Cast of the left astragalus. The original is from the Middle Miocene of Sansan, and is preserved in the Paris Museum. *Hastings Collection. Purchased*, 1855.

Amphicyon palæindicus, Lydekker[1] (*ex* Falc.).

A species somewhat smaller than the large race of *A. major*.
Hab. India.

M. 1558, 32729. Two casts of the second right upper true molar. The original of these specimens, which is the type of the species, was obtained from the Siwaliks of Kúshalghar, Punjab, India, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 248, pl. xxxii. fig. 8.
M. 1558 *purchased*, 1884; 32729 *presented by Dr. Falconer.*

M. 1557. Cast of a fragment of the right ramus of the mandible, containing the milk and permanent carnassials. The original of this specimen was obtained from the Siwaliks of Núrpúr, in the sub-Himalayan region, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 250, pl. xxxiii. figs. 5, 5*a*.
Purchased, 1884.

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. i. p. 84 (1876).

Amphicyon lemanensis, Pomel [1].

Syn. *Amphicyon blainvillei*, P. Gervais.
Amphicyon elaverensis, P. Gervais.
Amphicyon gracilis, Pomel.
Amphicyon larteti, Bravard (MS.).
Amphicyon leptorhynchus, Pomel.
Amphicyon minor, Blainville (*in parte*).
Cynelos langensis, Jourdan (MS.).

The cheek-teeth of the typical race of this species are about the size of those of *Canis lupus*, but some specimens are considerably smaller. Some of the limb-bones referred to this species are larger than the corresponding bones of the Wolf, and it is possible that these differences may be of specific value.

Hab. Europe.

30975. (*Fig.*) The hinder portion of the palate, containing the last three premolars of the right side, and the first two true molars of both sides; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. The dentition of the left side of the specimen (reversed) is figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xi. fig. 3, under the above name. The specimen is entered in the Museum Register as *A. larteti*, Bravard, MS.

Bravard Collection. Purchased, 1852.

30879. Fragment of the left maxilla, containing the carnassial and the first true molar, in an unworn condition; from the Lower Miocene of Puy-de-Dôme, France.

Hastings Collection. Purchased, 1855.

30976. An upper true molar; from the Lower Miocene of Allier.

Bravard Collection. Purchased, 1852.

26732. The greater portion of the right ramus of the mandible, containing the first and second true molars, and the bases of the other cheek-teeth; from the Lower Miocene of Allier. This specimen is precisely similar to one figured by Filhol in the Arch. Mus. Lyon. vol. iii. pl. i. fig. 1. It exhibits remarkably well the meionocreodont character of the species, $\overline{\text{m.}\,2}$ being of precisely the same size as the homologous tooth of *C. lupus*, while

[1] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 379 (1846). The synonymy is mainly taken from Filhol, Ann. Sci. Géol. vol. x. art. 3, p. 77.

$\overline{\text{m. 1}}$ is not more than two-thirds the size of the lower carnassial of that species.

Pomel Collection. Purchased, 1851.

26732. Fragment of the left ramus of the mandible, containing the unworn carnassial, the alveolus of $\overline{\text{m. 2}}$, and the germ of $\overline{\text{m. 3}}$ *in alveolo* ; from the Lower Miocene of Allier.

Pomel Collection. Purchased, 1851.

30978. Fragment of the right ramus of the mandible, containing $\overline{\text{m. 2}}$; from the Lower Miocene of Allier.

Bravard Collection. Purchased, 1852.

Note.—The specific reference of the following limb-bones must be considered as more or less provisional; their determination rests mainly on the evidence of specimens figured by Filhol and on Bravard's MS. Catalogue.

26744. The distal extremity of the right humerus ; from the Lower Miocene of Allier. This specimen is almost of exactly the same size as one figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xiv. fig. 2, under the name of *A. lemanensis*, var. *leptorhynchus*. A longer bone, referred by the same writer to the typical race, is figured in the Arch. Mus. Lyon. vol. iii. pl. i. fig. 6. This bone is much larger than the humerus of *Canis lupus*.

Pomel Collection. Purchased, 1851.

30985. The distal portion of the left humerus ; from the Lower Miocene of Allier. This specimen is rather larger than No. 26744. *Bravard Collection. Purchased*, 1852.

30986. The distal extremity of the left humerus ; from the Lower Miocene of Allier. This specimen is the same size as No. 26744. *Bravard Collection. Purchased*, 1852.

43992. The right humerus of a young individual, wanting the proximal extremity ; from the Lower Miocene of Langy (Allier), France. *Purchased*, 1872.

26734. The right humerus, wanting the proximal extremity, of a small form of *Amphicyon* ; from the Lower Miocene of Allier. It is doubtful whether this and the preceding specimen should be refered to one of the smaller races or young individuals of *A. lemanensis*, or to one of the smaller species of the genus. *Pomel Collection. Purchased*, 1851.

26746. The distal two-thirds of the right ulna; from the Lower Miocene of Allier. This specimen is very similar to, but slightly smaller than, an ulna figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xiv. fig. 3; it indicates a considerably smaller form than the humerus, No. 26744, and its specific reference is provisional.

Pomel Collection. *Purchased*, 1851.

26747. The acetabular portion of the right innominate; from the Lower Miocene of Allier.

Pomel Collection. *Purchased*, 1851.

30988. The proximal extremity of the right femur; from the Lower Miocene of Allier. This bone indicates an animal of about the same size as that to which the humerus No. 26744 belonged. *Bravard Collection.* *Purchased*, 1852.

26745. The proximal half of the left femur; wanting the great trochanter; from the Lower Miocene of Allier. This specimen is of about the same size as the femur of *Canis lupus*; and is very similar to a specimen figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xv. fig. 5.

Pomel Collection. *Purchased*, 1851.

43994. The shaft of the left femur; from the Lower Miocene of Langy, Allier. This bone is somewhat larger than the femur of *Canis lupus*. *Purchased*, 1872.

30995. The right astragalus; from the Lower Miocene of Allier. This specimen is much larger than the astragalus of *Canis lupus*, and somewhat larger than a specimen figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xvi. fig. 4; its specific determination is open to doubt.

Bravard Collection. *Purchased*, 1852.

Amphicyon ambiguus, Filhol [1].

This is a large species, distinguished by the transversely elongated form of the first and second upper true molars, and the minute size of m. 3, which is evidently in course of disappearance.

Hab. France.

M. 1686. Fragment of the left maxilla, containing the carnassial, the first and second true molars, and the alveolus of the third true molar; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen agrees precisely

[1] Comptes Rendus, vol. lxxxii. p. 289 (1876).

with the one of the opposite side figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xii. fig. 23. *Purchased*, 1884.

M. 1377. Two specimens of a right lower carnassial, probably belonging to the present species; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. The larger of the two specimens corresponds, however, with the same tooth in *A. lemanensis* (No. 26732); but that species is not recorded from the phosphorites. *Purchased*, 1884.

Amphicyon dominans, H. von Meyer[1].

A species of the size of the smaller race of *Amphicyon lemanensis*, with which it may possibly be identical. It has never been properly described.

Hab. Germany.

30442. Two detached upper true molars; from the Lower Miocene of Mayence. *Hastings Collection. Purchased*, 1855.

Amphicyon (?) sp.

Hab. France.

M. 1377 a. Fragment of the left maxilla, containing the penultimate true molar; from the Upper Eocene of Caylux, France. *Purchased*, 1884.

Bones specifically undetermined; from the Lower Miocene of Allier, France[2].

30984. The glenoidal extremity of the scapula. *Bravard Collection. Purchased*, 1852.

31006. The shaft of the right humerus of a young animal of small size. *Bravard Collection. Purchased*, 1852.

31007. The proximal extremity of a left ulna. *Bravard Collection. Purchased*, 1852.

30989. The proximal half of a left radius. This specimen may belong to *A. lemanensis*, but is smaller than the radius of *Canis lupus*. *Bravard Collection. Purchased*, 1852.

26735. A left radius, wanting the distal extremity. This specimen is considerably smaller than a radius of *A. lemanensis*

[1] Neues Jahrb. 1843, p. 388. According to Peters in the Denkschr. k. Ak. Wiss. vol. xxix. p. 191 (1869), the species is known merely by this preliminary notice.

[2] These specimens are referred to *Amphicyon* mainly on the authority of Bravard.

figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xv. fig. 3. *Pomel Collection. Purchased*, 1851.

30990. The distal extremity of the right radius, not improbably belonging to *A. lemanensis*.
Bravard Collection. Purchased, 1852.

31008. A complete left radius, about half the size of that of *Canis lupus*. *Bravard Collection. Purchased*, 1852.

30994. Part of the right innominate. This bone is nearly the same size as the innominate of *Canis lupus*, and may belong to *A. lemanensis*. *Bravard Collection. Purchased*, 1852.

26740. The right acetabulum; of much smaller size than the last specimen. *Pomel Collection. Purchased*, 1851.

26741. The right calcaneum of a young individual.
Pomel Collection. Purchased, 1851.

26736. The left calcaneum of a young individual.
Pomel Collection. Purchased, 1851.

26737–8. Metapodial bones. *Pomel Collection. Purchased*, 1851.

43990. An axis vertebra, rather larger than that of *Canis lupus*.
Purchased, 1872.

43991. Three dorsal vertebræ. *Purchased*, 1872.

26742. A lumbar vertebra, of very large size.
Pomel Collection. Purchased, 1851.

30982. The centrum of a vertebra.
Bravard Collection. Purchased, 1852.

26743. An early caudal vertebra.
Pomel Collection. Purchased, 1851.

43992. An early caudal vertebra. *Purchased*, 1872.

30983. Two caudal vertebræ. *Bravard Collection. Purchased*, 1852.

Bones from the Upper Eocene of the South of France, generically undetermined, but some of which may belong to Amphicyon.

M. 1694. Upper portion of the left femur. This specimen agrees very closely with a Lower Miocene specimen figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xiv. fig. 4, under the name of *Amphicyon lemanensis*. *Purchased*, 1884.

M. 1695. Upper portion of the left femur. This specimen agrees very closely with one from the Lower Miocene figured by Filhol (*op. cit.* fig. 3), under the same name.
Purchased, 1884.

M. 1713. The axis vertebra of a large Carnivore. This specimen is about $1\frac{1}{2}$ times the size of the axis vertebra from the Lower Miocene, figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xiii. fig. 2, and referred to *A. lemanensis*; but does not appear much too large for the cranium figured in the same plate. *Purchased*, 1884.

M. 1714. The calcaneum, nearly of the same size as the specimen from the Lower Miocene figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xvi. fig. 6.

M. 1715. Two smaller calcanea. *Purchased*, 1884.

M. 1716. Two right astragali. The larger may be feline.
Purchased, 1884.

M. 1717. Numerous metapodial bones. *Purchased*, 1884.

M. 1718. Several caudal vertebræ. *Purchased*, 1884.

Genus **SIMOCYON**, A. Wagner[1].

Syn. *Metarctos*, Gaudry[2].
Pseudocyon, Wagner[3].

History. The history of this genus is rather complex. In 1833 Kaup (Oss. Foss. de Darmstadt, pt. ii. p. 15) described and figured a lower jaw from Eppelsheim (of which, according to Gaudry, he had given a preliminary notice in 1832), under the name of *Gulo diaphorus*. In 1854 Roth and Wagner (Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. vii. pl. ii.) figured part of a lower jaw from Pikermi under the name of *Gulo primigenius*. Later on Wagner described another specimen under the name of *Canis lupus primigenius*. In 1857 (*op. cit.* vol. viii. p. 128, pl. vi. fig. 13) he figured a perfect skull and mandible under the name of *Pseudocyon robustus*, referring to it both his *Gulo primigenius* and *Canis lupus primigenius*. In the following year ('Geschichte der Vorwelt,' vol. ii.), according to Hensel, finding that the term *Pseudocyon* was preoccupied, Wagner proposed the new generic term *Simocyon*. In 1860 Gaudry ('Comptes Rendus,'

[1] Geschichte der Vorwelt, vol. ii. (1858) (*teste* Hensel).
[2] Comptes Rendus, vol. li. p. 926 (1860).
[3] Abh. math.-phys. Cl. k.-bay. Ak. Wiss. vol. viii. p. 128 (1857).

vol. li. p. 926) proposed the generic term *Metarctos*; and in the following year ('Animaux Fossiles et Géologie de l'Attique,' p. 37, pl. vi. figs. 1, 2) included in it both the Eppelsheim *Gulo diaphorus* and the Pikermi *Gulo primigenius*, making, however, no mention of the generic terms *Pseudocyon* and *Simocyon*. In 1862 Hensel (Monatsb. k. preuss. Ak. Wiss. [volume for 1863] p. 566) came to the conclusion that, on account of the difference in the number of their teeth, Gaudry's reference of the Eppelsheim and Pikermi forms to the same species was erroneous; and he accordingly applied the name *Simocyon primigenius* to the latter. Assuming that both specimens belong to the same genus (of which there is no doubt), it is evident that the generic term *Simocyon* is the correct one; and that the specific name *diaphorus* belongs to the Eppelsheim, and *primigenius* to the Pikermi form, if the latter be distinct. Seeing that no differences can be detected between the two forms with the exception of the variation in the number of the premolars, and bearing in mind the instances of *Icticyon venaticus* and *Hyæna felina*, the two forms are provisionally associated in this Catalogue.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(2-?)}{(2-4)}$, M. $\frac{2}{2}$. The position of the genus is evidently between the Bears and the Dogs.

Simocyon diaphorus (Kaup[1]).

Syn. *Gulo diaphorus*, Kaup.
Gulo primigenius, Roth and Wagner.
Canis lupus primigenius, Wagner.
Amphicyon minor, Blainville[2] (*in parte*).
Pseudocyon robustus, Wagner.
Simocyon robustus, Wagner.
Metarctos diaphorus, Gaudry.
Simocyon primigenius, Hensel.

Hab. Greece and Germany.

M. 412. Cast of the left ramus of the mandible, showing the two true molars, the two last premolars, and the alveoli of pm. 1 and pm. 2. The original of this specimen is from the Upper Miocene of Eppelsheim, Hesse Darmstadt; and is believed to be in the Museum at Darmstadt. It is the type of the species; and is figured by Kaup in the Oss. Foss. de Darmstadt, pt. ii. pl. i. figs. 1, 2, under the name

[1] Archiv für Natur, vol. v. p. 151, pl. ii. figs. 1, 2 (1832) (*teste* Gaudry). Oss. Foss. de Darmstadt, pt. ii. p. 15 (1833). The references to most of the synonyms are given above.

[2] Ostéographie, genus *Subursus*, p. 114 (1841).

of *Gulo diaphorus*. There are four premolars, two of which have fallen from their alveoli.

Enniskillen Collection. *Purchased*, 1882.

37355. Cast of part of the right ramus of the mandible, containing the broken canine, the alveolus of $\overline{\text{pm. 1}}$ (so determined from the last specimen), the last premolar, the carnassial, and the alveolus of $\overline{\text{m. 2}}$. The original is from the Lower Pliocene of Pikermi, Attica, and is in the Munich Museum; it is figured by Roth and Wagner in the Abh. Math.-phys. Cl.k.-bay. Ak. Wiss. vol. vii. pt. 2, pl. vii. figs. 1, 2, under the name of *Gulo primigenius*. There are no signs of $\overline{\text{pm. 2}}$ and $\overline{\text{pm. 3}}$ in this specimen, which agrees in this respect with the mandible figured by Gaudry in the 'Animaux Fossiles et Géologie de l'Attique,' pl. vi. figs. 1, 2, under the name of *Metarctos diaphorus*; the reference of this form to the same species as the Eppelsheim jaw being apparently somewhat provisional. In the Pikermi form the last premolar is larger than in the Eppelsheim, but in other respects the two are precisely similar in the form of the jaw and teeth. *Purchased*, 1863.

49675. Casts of the associated cranium and mandible. The originals of these specimens are from the Lower Pliocene of Pikermi and are preserved in the Munich Museum. They are figured by Wagner in the Abh. Math.-phys. Cl. k.-bay. Ak. Wiss. vol. viii. pl. vi. fig. 13, as *Pseudocyon robustus*. The cranium shows the incisors and the canine: behind the latter there is a small tooth which, judging from the analogy of the lower jaw, should probably be regarded as $\underline{\text{pm. 1}}$; there is a small interval, without any trace of alveoli, between this tooth and the carnassial, the latter being followed by the two true molars. The mandible shows the incisors and the canine, and contains $\overline{\text{pm. 4}}$, $\overline{\text{m. 1}}$, and $\overline{\text{m. 2}}$. There is no trace of the alveolus of $\overline{\text{pm. 1}}$, which is present in No. 37355.

The retention of the first premolar in both jaws, after the disappearance of the second and third teeth in both jaws, is analogous to the condition prevailing in *Ursus* and *Hyænarctos*. *Purchased*, 1879.

Genus **CEPHALOGALE,** Jourdan[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$.

Cephalogale geoffroyi, Jourdan[2].

This species has been recorded both from the Lower Miocene and Upper Eocene.

Hab. France.

26739. Part of the right maxilla, containing the carnassial and the first true molar; from the Lower Miocene of Allier, France. This specimen is referred to the present species on the authority of Filhol (Ann. Sci. Géol. vol. x. art. 3, pp. 117, 118): it agrees in size with the corresponding part of the type cranium (*op. cit.* pl. xvii.), but the inner tubercle of the carnassial appears somewhat smaller.
Pomel Collection. Purchased, 1851.

Cephalogale brevirostris (Croizet[3]).

Syn. *Canis brevirostris*, Croizet.
Canis issiodorensis, Blainville (*non* Croizet).
Amphicyon brevirostris, Pomel.
Cephalogale minor, Filhol[4].

Hab. Europe.

This species is referred to *Cephalogale* by Filhol, in the Ann. Sci. Géol. vol. x. art. 3, p. 119 (1879); the reasons for uniting with it *C. minor* are given below[5]. Filhol (Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, p. 37) has recorded his *C. minor* both from the Lower Miocene of Allier and the Upper Eocene of Tarn-et-Garonne.

31004. The greater portion of the left ramus of the mandible, containing the canine and all the cheek-teeth except $\overline{\text{pm. 1}}$ and $\overline{\text{m. 3}}$, which have fallen from their sockets; from the Lower Miocene of Allier, France. This specimen seems precisely similar to the one figured by De Blainville ('Ostéographie,' genus *Canis*, pl. xiii.) under the name of *Canis brevirostris*, and is intermediate in size between the

[1] Bull. Soc. Sav. 1862 (*teste* Filhol).

[2] *Ibid.* The species is described and figured by Filhol in the Ann. Sci. Géol. vol. x. art. 3, p. 107, pl. xvii. (1879).

[3] Gervais and Bronn give the reference for the specific name as Bull. Soc. Géol. France, ser. 1, vol. iv. p. 25; but it does not occur there.

[4] Ann. Sci. Géol. vol. x. art. 3, p. 118 (1879).

[5] In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 247, the species is given as an *Amphicyon*, the writer not having then noticed Filhol's redetermination.

two mandibles figured by Filhol in the Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. v. figs. 2, 4. There is a well-marked cingulum on the outer surface of $\overline{\text{m. 1}}$. The space occupied by the five middle cheek-teeth is 0,045, and the depth of the jaw at the carnassial 0,016.

Bravard Collection. Purchased, 1852.

M. 1687. The nearly complete right ramus of the mandible, containing the alveoli of the incisors, the canine, and all the cheek-teeth except $\overline{\text{m. 2}}$; from the Upper Eocene of Bach, near Lalbenque (Lot), France. This specimen, which is represented in the accompanying woodcut (fig. 20), is

Fig. 20.

Cephalogale brevirostris (Croizet).—The right ramus of the mandible; from the Upper Eocene of Bach. $\frac{1}{1}$.

intermediate in size between the larger of the two mandibles figured by Filhol (Ann. Soc. Sci. Phys. Nat. Toulouse, 1882, pl. v. fig. 4) under the name of *Cephalogale minor*, and the one figured by the same writer in the Ann. Sci. Géol. vol. x. pl. xviii. fig. 10, under the name of *C. brevirostris*. The space occupied by the five middle cheek-teeth is 0,0475, that by the four premolars 0,032, and the depth of the jaw at the carnassial 0,0176.

Purchased, 1884.

M. 1688. The anterior portion of the right ramus of the mandible, containing the alveolus of the canine, the four premolars, and the blade of the carnassial; from the Upper Eocene of Bach. This specimen agrees very closely with the one figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xviii. fig. 10, under the name of *C. brevirostris*. The length of

the space occupied by the four premolars is 0,0355, and the depth of the jaw at the carnassial 0,0186.

In the following table the dimensions of the three specimens figured by Filhol under the names of *C. minor* and *C. brevirostris* are compared with those of the present and the two preceding specimens, viz.:—

	Filhol, No. 1.	No. 31004.	Filhol, No. 2.	No. M. 1687.	No. M. 1688.	Filhol, No. 3.
Space occupied by 5 middle cheek-teeth..... ...	0,039	0,045	0,042	0,0475	...	0,055
Space occupied by 4 premolars.....	...	...	...	0,032	0,0355	...
Depth of jaw at $\frac{m\ 1.}{}$	0,012	0,016	0,0175	0,0176	0,0186	0,020

In Filhol's specimen No. 2 the second true molar is relatively short, and, if this be borne in mind, it will be seen that there is such a gradual increase in point of size from the smallest to the largest specimen that no distinction can be drawn in this respect; and since there is no structural difference in any of the specimens, it seems necessary to refer them all to one species, and to abolish Filhol's *Cephalogale minor*. *Purchased*, 1884.

Bones provisionally referred to large Canoids; from the Upper-Eocene Phosphorites of France.

M. 1710–11. An associated right humerus and left tibia; from Bach, near Lalbenque (Lot), France. These bones are slightly larger than two specimens of the homologous bones figured by Filhol in the Ann. Sci. Géol. vol. iii. pl. xviii. figs. 42, 43, but present precisely similar characters. It has been suggested that the figured specimens may belong to *Brachycyon gaudryi*, Filhol. The humerus is remarkable for the great width of the distal extremity, and especially of the part surrounding the entepicondylar foramen, which is of very large size. There is a supracondylar perforation, which is not found in *Amphicyon*. *Purchased*, 1884.

M. 1712. The right calcaneum of a large Carnivore; from Jamblousse, near Limogne (Lot), France. *Purchased*, 1884.

Subfamily Ursinæ.

As already mentioned, it is difficult to say whether the genus *Dinocyon* should be referred to the present or the preceding subfamily.

Genus **DINOCYON,** Jourdan [1].

Dentition:—I. $\frac{?}{?}$, C. $\frac{1}{1}$, Pm. $\frac{?}{?}$, M. $\frac{2\,(?)}{3}$. The dentition is very similar to that of *Hyænarctos*, the most important difference being the more dog-like form of the upper true molars.

Dinocyon thenardi, Jourdan [2].

Hab. France.

41140. Cast of the hinder part of the left ramus of the mandible, showing the carnassial and the two tubercular molars. The original of this specimen, which is one of the types of the genus and species, was obtained from the Middle Miocene of Grive-St.-Alban (Isère), France, and is preserved in the Museum of Natural History at Lyons. It is figured by Filhol in the Arch. Mus. Lyon, vol. iii. pl. iii. figs. 4, 5. *Purchased*, 1868.

Genus **HYÆNARCTOS,** Falconer and Cautley [3].

Syn. *Agriotherium*, A. Wagner [4] (*teste* P. Gervais).
Amphiarctos, Blainville [5].
Sivalarctos (*Sivalours*), Blainville [6].

Hyænarctos sivalensis, Falconer and Cautley [7].

Syn. *Ursus sivalensis*, Falconer and Cautley [8].
Agriotherium sivalense, Wagner.
Amphiarctos sivalensis, Blainville.
Sivalarctos sivalensis, Blainville.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{2}{3}$.

Hab. India.

[1] Comptes Rendus, vol. liii. p. 962 (1861). [2] *Loc. cit.*

[3] In Owen's 'Odontography,' p. 505 (1840–45). For the history of this genus see 'Palæontologia Indica,' ser. 10, vol. ii. p. 219.

[4] Gelehrte Anzeigen, 1837. The present writer has been unable to find the passage.

[5] Ostéographie, genus *Subursus*, p. 102 (1841).

[6] Comptes Rendus, vol. xiii. p. 165 (1841); Ostéographie, genus *Subursus*, p. 114 (1841).

[7] Asiatic Researches, vol. xix. p. 193 (1836), *Ursus*.

[8] *Loc. cit.*

39721. (*Fig.*) Cranium; from the Pliocene of the Siwalik Hills, India. This specimen is the type of the genus and species, and is described by Falconer and Cautley in the passage of the 'Asiatic Researches' already cited. It is also described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 220 *et seq.*; and is figured by Falconer and Cautley, of one third the natural size, in figs. 1, 1*a*, 1*b*, of plate O of the 'Fauna Antiqua Sivalensis:' it is also figured, of one fourth the natural size, in 'Falconer's Palæontological Memoirs' (pl. xxvi. fig. 1). The dentition of one side is figured, of the natural size, in fig. 1 *c* of the first-mentioned plate; and, of three fourths the natural size, in fig. 2 of the second plate. The dentition is also figured from the lateral and palatal aspects, of one third the natural size, in plate cxxxi. of Owen's 'Odontography.' In fig. 5 of plate xxx. of the above-quoted volume of the 'Palæontologia Indica,' the dentition of the left side (the canine having been restored from the opposite side) is figured from the palatal aspect, of the natural size.

In this specimen the carnassial (pm 4.) and the two true molars are perfect on the left, and but slightly damaged on the opposite side. Both canines are present, that of the right side being nearly perfect. The alveoli of the premolars and incisors are distinct, although the teeth themselves have dropped out. The only considerable deficiencies are in the posterior and lower part of the occiput, both zygomatic arches, and in the lower end of the nasals, where a fissure extends across the face on both sides towards the orbits. *Cautley Collection. Presented*, 1842.

39722. (*Fig.*) Part of the right ramus of the mandible; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley from the outer side (reversed) in plate O. fig. 2 of the 'Fauna Antiqua Sivalensis' ($\frac{1}{3}$), and in vol. i. plate xxvi. fig. 3 of 'Falconer's Palæontological Memoirs' ($\frac{1}{4}$): it is also figured from the dental aspect in fig. 2 *a* of the former plate ($\frac{1}{1}$), and in fig. 4 of the latter ($\frac{3}{4}$); and in plate cxxxi. figs. 3 and 4 of Owen's 'Odontography' ($\frac{1}{3}$). It is described by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 223–4. This specimen is broken off where the canine emerges from its alveolus; the imbedded portion of that tooth presenting an antero-posterior diameter of 0,041, and a transverse of 0,025. The

cheek-teeth are six in number, but of the first two and the last only the alveoli remain. The teeth are much worn, indicating the advanced age of the animal. The first alveolus is placed a short distance behind the canine, and consists of a single cavity, which, judging from the analogy of *Ursus*, probably contained $\overline{\text{pm. 1}}$; $\overline{\text{pm. 2}}$ being absent[1]. The second alveolus is placed very close to the first, and also to the succeeding tooth: it must have carried the third premolar ($\overline{\text{pm. 3}}$); and there could not have been another tooth between this and the first alveolus. The fourth premolar is a distinctly trilobed tooth. The carnassial is much damaged, and the third molar has fallen from its alveolus.

Cautley Collection. Presented, 1842.

39725–6. (*Fig.*) The associated right radius and ulna; from the Pliocene of the Siwalik Hills. These specimens are figured by Falconer and Cautley in supplemental plate O. fig. 4 of the 'Fauna Antiqua Sivalensis;' and are noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 225. *Presented by Gen. Sir W. E. Baker, K.C.B.* 1848.

39724. (*Fig.*) Distal extremity of a metacarpal; from the Pliocene of the Siwalik Hills. This specimen is figured by Falconer and Cautley in plate O. fig. 6 of the 'Fauna Antiqua Sivalensis;' and is noticed by the writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 225.

Cautley Collection. Presented, 1842.

37147. (*Fig.*) Part of a phalangeal; from the Pliocene of the Siwalik Hills. This specimen is figured in plate O. fig. 7 of the 'Fauna Antiqua Sivalensis,' and is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 225.

Cautley Collection. Presented, 1842.

37143. (*Fig.*) The axis vertebra; from the Pliocene of the Siwalik Hills. This bone is figured in plate O. fig. 3 of the 'Fauna Antiqua Sivalensis,' where it is referred to the present species. It is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 225, where doubt is expressed as to the correctness of the generic reference.

Cautley Collection. Presented, 1842.

[1] In the memoir cited the present writer considered that the first cheek-tooth was probably $\overline{\text{pm. 2}}$.

39723. The right femur; from the Pliocene of the Siwalik Hills. (*Fig.*) This specimen is figured in plate O. fig. 5 of the 'Fauna Antiqua Sivalensis;' and is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 224, pl. xxix. figs. 1, 1*a*, 1*b*.

Cautley Collection. Presented, 1842.

Hyænarctos punjabiensis, Lydekker[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{?}{3}$, M. $\frac{2}{3}$.

Hab. India.

M. 1564. Cast of five associated upper cheek-teeth. The originals of these specimens were obtained from the Siwaliks of the Punjab, India, and are preserved in the Indian Museum, Calcutta: with the mandible noticed below, they are the type of the species. These teeth comprehend pm. 4 and m. 1 of either side, and an early premolar of one side; they are described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 226–7, pl. xxx. fig. 2. The carnassial is distinguished from that of *H. sivalensis* by the smaller size of the anterior talon, and a difference in the size and position of the inner tubercle. The true molar is distinguished by the more quadrate form of the crown, by the convexity of the posterior border, and by the smaller degree of development of the external cingulum, and the somewhat less bold form of the outer lobes: the most marked distinction is, however, the closer approximation of the central line of

Fig. 21.

Hyænarctos punjabiensis.—Third left upper true molar, from a specimen of the maxilla; from the Siwaliks of the Punjab. Indian Museum, Calcutta. $\frac{1}{1}$. (From the 'Palæontologia Indica.')

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 226 (1884).

the outer lobes and the internal ridge. The accompanying woodcut (fig. 21) shows a last left upper true molar of the present species, taken from a maxilla in the Indian Museum, from the Siwaliks of the Punjab, and described by the present writer in the passage cited. *Purchased*, 1884.

M. 1565. Cast of the nearly complete mandible, containing both rami, and showing the canines and three true molars, with the alveoli of three premolars. The original of this specimen was obtained from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 229–31, pl. xxxi. figs. 1, 1 *a*. In the figure the small tooth behind the canine is lettered $\overline{\text{pm. 2}}$ (?): it seems, however, from *Ursus* that it is more probably $\overline{\text{pm. 1}}$. *Purchased*, 1884.

Hyænarctos palæindicus, Lydekker[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{?}{?}$, M. $\frac{2}{2\,(?)}$.

Hab. India.

M. 1561. Cast of a portion of the right maxilla, containing the carnassial and the two true molars. The original of this specimen, which is the type, was obtained from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 232–4, pl. xxx. fig. 1. The teeth are more dog-like than those of *H. sivalensis* and *H. punjabiensis*, and thereby indicate nearer affinity to *Dinocyon*.

Purchased, 1884.

M. 1562. Cast of a fragment of the right ramus of the mandible, containing $\overline{\text{m. 2}}$, in an unworn condition. The original of this specimen is from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 234–5, pl. xxxi. fig. 3. The reference of this and the next specimen to the present species is provisional. There are no traces of any alveolus for $\overline{\text{m. 3}}$; from which it has been inferred that this tooth was probably absent. *Purchased*, 1884.

[1] Palæontologia Indica (Mem. Geol. Surv. Ind.), ser. 10, vol. ii. p. 232 (1884).

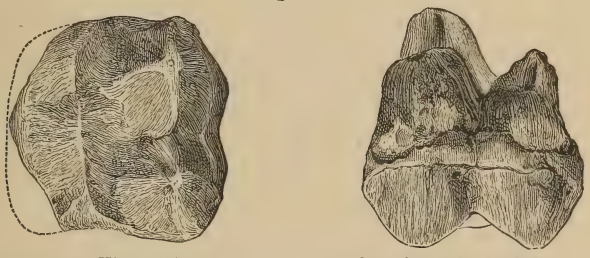
M. 1363. Cast of a fragment of the right ramus of the mandible, containing $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$, with the alveolus of pm. 3. The original of this specimen was obtained from the Siwaliks of the Punjab, and is preserved in the Indian Museum, Calcutta. It is figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 234–5, pl. xxxi. fig. 2. The last premolar is much smaller than in *H. punjabiensis*, and $\overline{\text{pm. 3}}$ is inserted by two distinct fangs, which is not the case in that species or in *H. sivalensis*. *Purchased*, 1884.

Hyænarctos, sp.

Hab. England.

44583. Cast of the first left upper true molar. The original of this specimen was obtained from the Red Crag of Suffolk; and is in the Reed Collection in the York Museum. This

Fig. 22.



Hyænarctos, sp. First right upper true premolar; from the Red Crag: *a*, from the masticating surface; *b*, from the outer side; the dotted line in *a* represents the outline of the York specimen. ½. (From the Geological Society's 'Journal.')

specimen, together with the corresponding tooth of the right side (represented in the accompanying woodcut, fig. 22, and now in the Canham Collection of the Ipswich Museum), have been provisionally referred by Flower, in the Quart. Journ. Geol. Soc. vol. xxxiii. p. 534, to *Hyænarctos sivalensis*. The present writer has, however, suggested, in the 'Palæontologia Indica,' ser. 10, vol. ii. pp. 227–8, that this provisional reference is doubtful.

Purchased, 1884.

Hyænarctos (?), sp.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{?}{2}$, M. $\frac{3}{3}$.

Hab. Italy.

37348. Cast of the right ramus of the mandible. The original of this specimen was obtained from the Middle Miocene of Monte Bamboli, Tuscany, and is believed to be preserved in the Museum at Pisa. The specimen contains the canine, the third and fourth premolars, and the three true molars. It is described and figured by Meneghini in the Atti Soc. Ital. Sci. Nat. vol. iv. p. 18, pl. ii. A (1863), under the name of *Amphicyon laurillardi*. P. Gervais has, however, in the 'Zoologie et Paléontologie Générales,' ser. 2, p. 22 (1876), referred it to *Hyænarctos*. The teeth agree exactly with those of that genus, the carnassial being of the same form as that of *H. palæindicus*; but $\overline{\text{pm. 4}}$ is relatively larger and $\overline{\text{pm. 3}}$ inserted by one fang, as in *H. punjabiensis*. The Italian jaw is, however, greatly inferior in size to either of the three Indian species. The fourth premolar is a characteristic tooth, and wants the cusps which occur on the posterior border in *Amphicyon* and *Canis*.

It is possible that this specimen really belongs to a new species of *Hyænarctos*; but it is also possible that it may belong to *Dinocyon*, since the upper jaw figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. lxxxi. figs. 8, 9, under the name of *Hyænarctos hemicyon*, has been shown by the present writer, in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 202, to probably belong to *Dinocyon*; and the Italian jaw indicates an animal of about the same size. Unfortunately, $\overline{\text{pm. 4}}$ of *Dinocyon hemicyon* is unknown; and until that tooth be discovered it is impossible to say whether the present specimen may not have belonged to that genus or species. *Purchased*, 1863.

Hyænarctos, sp.

Hab. China.

28588. (*Fig.*) The second right lower true molar, in a partially worn condition; from the Pliocene (?) of South China. This specimen (woodcut, fig. 23) agrees exactly in size and general contour with the corresponding tooth of *H. punjabiensis*; the cusps and ridges are, however, somewhat less prominent, and the central depression on the posterior half is flatter. The specimen is insufficient for determining whether the species to which it belongs is distinct from one of the Siwalik species; but the occurrence of the genus in China (assuming that the tooth was not imported into

Fig. 23.

Hyænarctos, sp. Second right lower true molar; from the Pliocene (?) of China. $\frac{1}{1}$.

that country) is of considerable interest. The specimen has been previously noticed by the present writer in the Geol. Mag. dec. 3, vol. 1, p. 444 (1884).

Presented by D. Hanbury, Esq. 1853.

Genus **ARCTOTHERIUM**, Bravard[1].

Syn. *Arctoidotherium*, Bravard, MS.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{4}$, M. $\frac{2}{3}$.

Arctotherium bonariense (P. Gervais[2]).

Syn. (?) *Ursus braziliensis*, Lund[3].
Ursus bonariensis, P. Gervais[4].
Arctotherium latidens, Bravard[5].

Hab. S. America.

32915–6. (*Fig.*) The cranium and mandible, from the Pleistocene of the banks of the river Plata, Buenos Ayres. The cranium, of which the palate is represented in the accompanying woodcut (fig. 24), is imperfect posteriorly, and the mandible has lost the hinder part of the right ramus. The teeth are in a well-worn condition.

From the suppression of pm. 1, the double roots of pm. 3, the squareness of m. 1, and the smaller extent of the backward prolongation of the talon of m. 2, it is pretty certain that the South-American fossil is generically distinct from *Ursus*, and there is as little doubt that it is equally distinct from *Hyænarctos*. It forms, in fact, a genus almost pre-

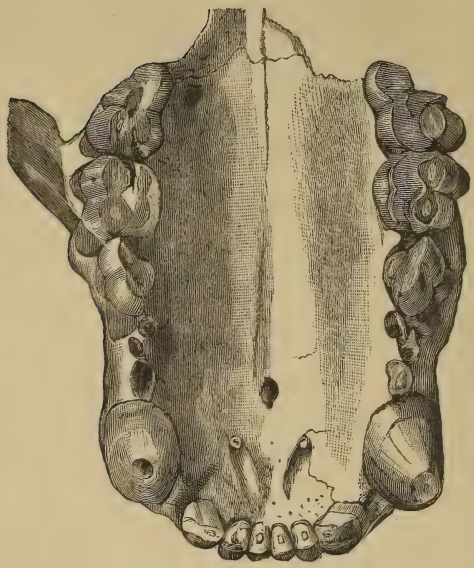
[1] Catalogue des Espèces d'Animaux Fossiles recueilles dans l'Amérique de Sud (Parana, 1860), *teste* P. Gervais.

[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 189 (1848–52), *Ursus*.

[3] Ann. Sci. Nat. (Zool.), ser. 2, vol. xi. p. 224 (1839). This name, if it really belongs to the same species, has the priority.

[4] *Loc. cit.* [5] *Loc. cit.*

Fig. 24.



Arctotherium bonariense. Palatal view of the cranium; from the Pleistocene of Buenos Ayres. ¼. (From the 'Palæontologia Indica.')

cisely intermediate between the other two—*H. punjabiensis* being the species of *Hyænarctos* most nearly related to it. From the study of the teeth, Falconer came to the conclusion that while *Hyænarctos* was probably carnivorous, *Arctotherium* subsisted on a vegetable diet. This skull, together with the following associated specimens, has been recently mounted as a skeleton.

Bravard Collection. Purchased, 1852.

32917–23. The seven cervical vertebræ, associated with No. 32915.

32924–36. Thirteen dorsal vertebræ of the same.

32937–43. Seven lumbar vertebræ of the same.

32944. The sacrum of the same.

32945–8. Four caudal vertebræ of the same.

32949–68. Twenty ribs of the same.

32969. The right ulna of the same.

32970. Part of the right innominate of the same.

32971. The right femur of the same.

32972. The right tibia of the same.

32973. The right radius of the same.

32974–91. Bones of the right hind foot of the same.

Genus **URSUS**, Linn.[1]

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{3}$. "The three anterior premolars above and below are very small, one-rooted, and often early deciduous, especially the second, which is rarely present in adult animals" (*Flower*).

Ursus spelæus, Rosenmüller[2].

Syn. *Ursus arctoideus*, Blumenbach (*teste* Owen).
Ursus fornicatus magnus, Schmerling.
Ursus fornicatus minutus, Schmerling.
Ursus planus, Oken.

The earlier premolars are usually absent; when present they are not crowded together; the inner tubercle of pm. 4 is elongated. The last lower premolar usually has two small cusps on the inner side in advance of the main cusps.

Hab. Europe.

* . The skeleton, made up from bones belonging to different individuals and from different localities. The different bones bear distinctive numbers, and some of them are entered below.

28544. The cranium, wanting the incisors and the left canine; from a cavern in Sundwig, Westphalia. The specimen is of enormous size, and the teeth are very much worn.
Purchased, 1853.

43713. The cranium, wanting the incisors; from a cavern in Lozère, France. This specimen is as large as the last, but the teeth are not so much worn.
Bravard Collection. Purchased, 1852.

4 (O. C.). The cranium, wanting most of the teeth; from the Gailenreuth Cave. *Sommering Collection. Purchased*, 1827.

[1] Syst. Nat. ed. 12, vol. i. p. 69 (1766).
[2] Oss. Fossil. Animal, p. 18 (1794).

28545. The cranium, wanting the incisors and both zygomatic arches; from a cavern in Sundwig, Westphalia. This specimen is of large size, and the teeth are much worn. *Purchased*, 1853.

28545 a. The cranium, wanting the incisors and the right canine; from the Sophia Cavern, Franconia, Bavaria. The teeth are in a well-worn condition, and the last molar is of unusual length, being longer than the two preceding teeth. *Purchased*, 1853.

28545 b. The cranium, wanting both zygomatic arches, the incisors, and the left canine; from the Sophia Cavern, Franconia. The teeth are in a middle condition of wear, and m. 2 is somewhat above the normal length. *Purchased*, 1853.

7 (O. C.). Cranium, wanting the left zygomatic arch and most of the teeth; from a cavern. The molars are very much worn. *Purchased.*

28545 c. The cranium, wanting the right zygomatic arch and the incisors; from a cavern. *Purchased.*

7833. The cranium, imperfect; from a cavern. The molars are scarcely worn; the incisors do not appear to belong to the specimen. *Mantell Collection. Purchased*, 1836.

43005. The cranium, imperfect; from a cavern near Liége, France. *Van Breda Collection. Purchased*, 1871.

4 a (O. C.). The cranium, imperfect; from the Gailenreuth Cave (?). The teeth are unworn. *Purchased.*

28546. The cranium, wanting both zygomatic arches and all the teeth except the carnassial and the first true molar; from a cavern in Sundwig, Westphalia. The true molar is partially worn; and the specimen is remarkable for exhibiting the alveoli of the first and third premolars. The cranium has a very regular profile, probably indicating that it belongs to a female individual. *Purchased*, 1853.

43798. The cranium, imperfect; from the cavern of Nabrigas (Lozère), France. The teeth are scarcely worn. *Bravard Collection. Purchased*, 1852.

8 (O. C.). Cranium, with portions of the femur and humerus attached; from a cavern in Muggendorf, Franconia, Bavaria. *Sommering Collection. Purchased*, 1857.

M. 378. Greater part of the cranium of a female, showing the cheek-teeth in a much-worn condition; from the Gailenreuth Cave. *Enniskillen Collection. Purchased*, 1882.

M. 377. Cranium, with the molars in an unworn condition; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

6 (O. C.). The cranium of a male, with the molars in a well-worn condition; from a cavern in Sundwig, Westphalia. This specimen, in which the nasals and zygomatic arches are wanting, is remarkable for its extreme length and the great development of the sagittal crest.
Sömmering Collection. Purchased, 1827.

17501. Cranium, wanting part of the left zygomatic arch and all the cutting-teeth except the left canine, with the molars in a much-worn condition; from the Sophia Cavern, Franconia. *Purchased.*

M. 377 a. Cranium of a male, wanting the incisors and the nasals and zygomatic arches; from the Gailenreuth Cave. Only the two last molars remain, which are in a well-worn condition. *Enniskillen Collection. Purchased*, 1882.

M. 377 b. Cranium, wanting the incisors and the right canine; from the Gailenreuth Cave.
Enniskillen Collection. Purchased, 1882.

2 (O. C.). Hinder part of the cranium; from a cavern in Muggendorf, Franconia. *Sömmering Collection. Purchased*, 1827.

43795. The anterior portion of the cranium, showing the three cheek-teeth in an unworn condition; from the cavern of Nabrigas (Lozère), France.
Bravard Collection. Purchased, 1852.

7 (O. C.). The anterior portion of the cranium, showing nearly all the teeth in an unworn condition; from the Gailenreuth Cave. *Sömmering Collection. Purchased*, 1827.

43714. Part of the left maxilla, containing the two true molars, in a well-worn condition; from a cavern.
Bravard Collection. Purchased, 1852.

43715. Part of the right maxilla, containing the three cheek-teeth in an unworn condition; from a cavern.
Bravard Collection. Purchased, 1852.

43796. Part of the right maxilla, containing the two true molars in an unworn condition; from a cavern.
Bravard Collection. Purchased, 1852.

43805. The nearly complete mandible of a sub-adult individual showing the canines and the cheek-teeth, in an unworn condition; from a cavern. This specimen is remarkable for containing the alveoli of the first premolars of either side. *Bravard Collection. Purchased*, 1852.

43005 a. The nearly complete mandible of a sub-adult individual; from a cavern near Liége, France.
Van Breda Collection. Purchased, 1871.

43847. The greater portion of the mandible of a sub-adult individual, showing the canines, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$; from a cavern. This specimen is remarkable for the almost total absence of the cusps on the inner side of $\overline{\text{pm. 4}}$.
Bravard Collection. Purchased, 1852.

9 (O. C.). The mandible of a small individual, wanting the incisors and three of the cheek-teeth; from a cavern in Sundwig, Westphalia. *Sömmering Collection. Purchased*, 1827.

43800. The mandible of an immature individual, showing the permanent dentition imperfectly protruded; from a cavern. On the right side there is the alveolus of an extremely minute $\overline{\text{pm. 3}}$, which evidently had no predecessor.
Bravard Collection. Purchased, 1852.

28548. The right ramus of the mandible of a very large and aged individual; from a cavern in Sundwig, Westphalia.
Purchased, 1853.

17495. The right ramus of the mandible, wanting the incisors; from the Sophia Cavern, Franconia. *Purchased.*

17496. The right ramus of the mandible, wanting the incisors; from the Sophia Cavern, Franconia. The last molar is very short and wide. *Purchased.*

M. 287. The right ramus of the mandible, wanting the incisors, of a huge individual; from the Kühloch Cave, Franconia. The last molar is very wide.
Enniskillen Collection. Purchased, 1882.

17497. The right ramus of the mandible, wanting the incisors; from the Sophia Cavern, Franconia. *Purchased.*

43762. The right ramus of the mandible, wanting the incisors; from a cavern. *Bravard Collection. Purchased*, 1852.

28549. The right ramus of the mandible, wanting the incisors, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

43803. The right ramus of the mandible, wanting the incisors; from a cavern. *Bravard Collection. Purchased*, 1852.

9 (O. C.). The right ramus of the mandible, containing the last two teeth; from a cavern in Sundwig. *Sömmering Collection. Purchased*, 1827.

43848. The right ramus of the mandible of a young individual, wanting the incisors and the last molar; from a cavern. This specimen shows the alveoli of $\overline{\text{pm. 1}}$ and $\overline{\text{pm. 2}}$. *Bravard Collection. Purchased*, 1852.

16448. (*Fig.*) The right ramus of the mandible, wanting the incisors; from the Forest-bed of Bacton, Norfolk. This specimen is described and its dentition figured by Owen in the 'British Fossil Mammals and Birds,' p. 89, fig. 35 c, p. 106. The teeth are of very small size. *Green Collection. Purchased*, 1843.

18307. (*Fig.*) Fragment of the right ramus of the mandible of a very young individual, containing the second true molar; from Kent's-Hole Cavern, Torquay. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' fig. 36, p. 108. In the figure the canine is shown, which is now wanting. *McEnery Collection. Purchased*, 1842.

26490. The greater portion of the mandible of an adolescent individual; from a cavern. This specimen is remarkable in that the molars of one side differ in form from those of the other. *No history.*

17498. The left ramus of the mandible, wanting the incisors; from the Sophia Cavern, Franconia. *Purchased.*

28547. The left ramus of the mandible, wanting the incisors, and of very large size; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

43721. The left ramus of the mandible, with the teeth much worn; from a cavern. *Bravard Collection. Purchased*, 1852.

9 a (O. C.). The left ramus of the mandible, containing the canine and the last two molars; from a cavern in Sundwig, Westphalia. *Sömmering Collection. Purchased*, 1827.

10 (O. C.). Hinder part of the left ramus of a very large mandible, containing the last two molars; from a cavern in Sundwig. *Sömmering Collection. Purchased*, 1827.

725, 18277. Two canines; from Kent's-Hole Cavern, Torquay. *McEnery Collection. Purchased*, 1842.

48731. (*Fig.*) A canine; from Brixham Cave, near Torquay. This specimen is figured by Busk in the Phil. Trans. for 1873, pl. xlvi. fig. 1, and provisionally referred to the present species. *Brixham-Cave Collection. Presented*, 1876.

48757. A canine; from Brixham Cave, Torquay. This specimen is similar to the last. *Brixham-Cave Collection. Presented*, 1876.

28552. Two canines of enormous size; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

39786. The last right upper true molar; from a cavern at Montmartre, France. *Purchased*, 1862.

21237 x. Several upper molars; from the Gailenreuth Cave. A last molar among these specimens is remarkable for the excessive width of its talon. *Purchased.*

189289. Molar and canine teeth; from Kent's-Hole Cavern, Torquay. *Presented by Rev. Upton Richards*, 1845.

16685, 16726, 16747. Molar teeth; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

43811. Two humeri (and others imperfect); from a cavern in Nabrigas (Lozère), France. *Bravard Collection. Purchased*, 1852.

43729. Proximal extremity of the left humerus, of gigantic size; from a cavern in Nabrigas. *Bravard Collection. Purchased*, 1852.

43812. The right and left ulnæ of the same individual; from a cavern in Nabrigas. *Bravard Collection. Purchased*, 1852.

43731. The associated left ulna and radius; from a cavern in Nabrigas. *Bravard Collection. Purchased*, 1852.

43778. Four specimens of the proximal extremity of the ulna; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

43776. The right radius; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

17489. The left radius, of small size; from the Sophia Cavern, Franconia. *Purchased.*

43815. The left carpus and metacarpus; from a cavern in Nabrigas. *Bravard Collection. Purchased*, 1852.

43735–40. The metacarpals and phalanges of the two feet; from the caverns of Lozère.
Bravard Collection. Purchased, 1852.

32507. Two metacarpals of very large size; from a cavern in the Department of Doubs, France.
Tesson Collection. Purchased, 1857.

M. 232. The sacrum and pelvis; from the Gailenreuth Cave. Mounted in the skeleton.
Enniskillen Collection. Purchased, 1882.

17551. The sacrum and pelvis of a small individual, incomplete; from the Sophia Cavern, Franconia. *Purchased.*

43749, 43741. Parts of the innominate; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

43744, 43751, 43787, 43822. Four specimens of the tibia; from a cavern in Nabrigas. No. 43744 is mounted in the skeleton. *Bravard Collection. Purchased*, 1852.

43752. The left fibula; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

43742. The left femur, of large size; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

17472. The left femur, of small size; from the Sophia Cavern, Franconia. *Purchased.*

43742 a. The distal extremity of the right femur, of large size; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

46139. The proximal two-thirds of the left femur; dredged off the eastern coast of England.
Owles Collection. Purchased, 1874.

43747, 43757. The metatarsal and phalangeal bones of the two feet; from a cavern in Nabrigas.
Bravard Collection. Purchased, 1852.

43723. The greater part of the vertebral column; from a cavern in Nabrigas. *Bravard Collection. Purchased*, 1852.

49174. The broken atlas vertebra, of large size; from the Kühlock Cave, Franconia.
Presented by the Earl of Enniskillen, 1878.

21273 x. The atlas and axis vertebræ; from the Gailenreuth Cave.
Purchased.

Note.—There is a very large series of remains of this species in the Museum which it has not been considered advisable to catalogue. It comprehends specimens from the following localities, viz.:—

Sophia Cavern, Franconia, Bavaria.
Sundwig, Westphalia.
Muggendorf, Franconia.
Kent's-Hole Cavern (*McEnery Collection*).
Gailenreuth Cave, Franconia (*Egerton Collection*).
Kühlock Cave, Franconia (*Enniskillen Collection*).

Ursus horribilis, Ord.[1]

Syn. *Ursus bourguignati*, Lartet[2].
Ursus cinereus, Desmarest.
Ursus ferox, Richardson.
Ursus ferox fossilis, Busk.
Ursus fossilis, Goldfuss[3].
Ursus horridus, Baird.
Ursus priscus, Cuvier[4] and Goldfuss[5].
Ursus planifrons, Denny[6].
Ursus richardsoni, Baird.
Danis cinereus, Gray.

In this species the jugal arcade is elliptical, and less nearly circular than in *Ursus arctos*, while the posterior narial aperture is narrower and usually more rounded than in that species. The last upper true molar is but slightly contracted posteriorly, the inner tubercle of pm. 4 is very large, the premolars are separate, and the palate is flattened. According to Busk there is usually a minute

[1] In Guthrie's 'Geography,' 2nd American ed., vol. ii. pp. 291, 299 (1815), *teste* Baird.
[2] Ann. Sci. Nat. ser. 5, vol. viii. p. 161 (1867).
[3] Nova Acta Ac. Cæs. Leop.-Car. vol. x. pt. 2, pp. 259–276 (1821).
[4] Oss. Foss. vol. iv. p. 380 (1823).
[5] Nova Acta Ac. Cæs. Leop.-Car. vol. xi. pt. 2, p. 468 (1823).
[6] Proc. Geol. Soc. W. Riding Yorksh., April 1864.

inner cusp to $\overline{\text{pm. 4}}$, corresponding to the hinder of the two inner cusps in the homologous tooth of *U. spelæus*. In one recent cranium (B. M. No. 1137 *b*), however, this cusp is absent; and it is also wanting in some of the specimens noticed below.

Hab. North America (Recent), and Europe (Pleistocene).

1 (O. C.). (*Fig.*) Cranium and mandible, wanting the upper incisors, the earlier premolars, and the right zygomatic arch; from a cavern in Muggendorf, Franconia, Bavaria. This fine specimen is the type of the so-called *Ursus fossilis*, and is figured and described under that name by Goldfuss in the Nova Acta Ac. Cæs. Leop.-Car. vol. x. pt. 2, p. 259, pl. xx. c. It is also figured, under the name of *U. priscus*, by Cuvier in the 'Ossemens Fossiles,' vol. iv. pl. clxxxix. figs. 5, 6 (1823); and the right lower dentition is figured by Owen in the 'British Fossil Mammals and Birds,' p. 106, fig. 35 B, under the same name. The specimen is of relatively small size, and the cheek-teeth are but little worn. *Sömmering Collection. Purchased*, 1827.

M. 230. (*Fig.*) Cranium of a very large male; from alluvium near Ballinamore, County Leitrim, Ireland. In this specimen all the teeth except the canines and the last true molars have fallen from their sockets. It is described and figured by Leith Adams in the Proc. R. Dublin Soc. new ser. vol. ii. p. 51, pl. iii. (1878). The last molar is unusually narrow behind. *Enniskillen Collection. Purchased*, 1882.

28906. Cranium, wanting the incisors, some of the cheek-teeth, and part of the left zygomatic arch; from a bog at Clonbourne, near Parsonstown, King's County, Ireland. This specimen is of medium size, and the molars are very much worn; it is described by Leith Adams in the Proc. R. Dublin Soc. new ser. vol. ii. pp. 53–4.

Transferred from the Antiquarian Department, 1854.

38153. Cast of the cranium, wanting all the teeth; from a bog between Moyvore and Ballymahon, County Longford, Ireland. The original of this specimen is in the Leeds Museum, and seems to be the original of *Ursus planifrons*, Denny: it is described by Leith Adams in the Proc. R. Dublin Soc. new ser. vol. ii. pp. 52–3.

By exchange with the Royal Dublin Society.

23139. Fragment of the left maxilla, containing the two true molars, in a partially worn condition; from the Pleistocene of Grays, Essex. *Purchased*, 1848.

22030. Fragment of the right ramus of the mandible, containing the last premolar and the three true molars, in an almost unworn condition; from the Pleistocene of Grays. The molars are of great relative width, and the inner cusp of $\overline{\text{pm. 4}}$ is almost wanting. *Purchased*, 1848.

21652. Hinder portion of the right ramus of the mandible, containing the second true molar; from the Pleistocene of Grays. This specimen is of very large size. *Purchased*, 1848.

22030 a. Fragment of the right ramus of the mandible, containing the two true molars, in a partially worn condition, and the alveoli of the two preceding teeth; from the Pleistocene of Grays. *Purchased*, 1848.

21289. Fragment of the left ramus of the mandible, containing the last true molar and the alveoli of the three preceding teeth; from the Pleistocene of Grays. *Purchased*, 1848.

22029. The greater portion of the left ramus of the mandible, containing the four last cheek-teeth and the alveolus of the canine; from the Pleistocene of Grays. The last molar is remarkably short in this specimen, and there is no inner cusp to $\overline{\text{pm. 4}}$, although the talon has two distinct cusps. *Purchased*, 1848.

23138. Portion of the right ramus of the mandible, containing the last premolar (broken) and the first and second true molars; from the Pleistocene of Grays. *Purchased*, 1848.

28977. Fragment of the right ramus of the mandible, containing the three true molars (the first broken); from the Pleistocene (?) of Woodbridge, Suffolk. The teeth are of large size, and $\overline{\text{m. 2}}$ is unusually wide behind. *Purchased*, 1848.

21651. The left ramus of the mandible, containing the broken canine and the alveoli of the cheek-teeth; from the Pleistocene of Grays. The specific reference of this specimen is merely provisional. *Purchased*, 1848.

47677. (*Fig.*) The greater portion of the right ramus of the mandible, containing the alveoli of the incisors, the broken base of the canine, the alveolus of $\overline{\text{pm. 1}}$, the first and second true molars in a slightly worn condition, and the alveolus of $\overline{\text{m. 3}}$; from the Genista Cave, Gibraltar. This specimen

is described and figured by Busk in the Trans. Zool. Soc. vol. x. p. 64, pl. iv. figs. 1, 2[1], where (together with the specimens from the same locality noticed below) it is provisionally referred to the present species, or to a form intermediate between it and *U. arctos*.

Brome Collection. Presented, 1876.

47676. (*Fig.*) Fragment of the right maxilla, containing the two true molars, in a partially worn condition; from the Genista Cave, Gibraltar. This specimen is figured by Busk, *op. cit.* pl. iv. fig. 3. *Brome Collection. Presented*, 1876.

47678. (*Fig.*) Anterior portion of the right ramus of the mandible of a young individual, containing the imperfectly protruded canine, the first two true molars, and the alveoli or bases of the two preceding cheek-teeth; from the Genista Cave, Gibraltar. This specimen is figured by Busk, *op. cit.* pl. v. fig. 3. *Brome Collection. Presented*, 1876.

47678 b. (*Fig.*) Fragment of the right ramus of the mandible, containing the broken canine and the first premolar; from the Genista Cave, Gibraltar. This specimen is figured by Busk, *op. cit.* pl. iv. figs. 3, 4. The premolar shows the inner cusp, partially worn. *Brome Collection. Presented*, 1876.

47678 a. (*Fig.*) Fragment of the right ramus of the mandible, containing the two last true molars, in an unworn condition; from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk, *op. cit.* pl. v. figs. 4, 5, 7. The second molar is remarkable for its extreme width and shortness.

Brome Collection. Presented, 1876.

47679. (*Fig.*) The crown of the left lower canine; from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk, *op. cit.* pl. v. fig. 6. *Brome Collection. Presented*, 1876.

40949. (*Fig.*) The right ramus of the mandible, containing the canine, the second true molar, and the alveoli of all the other cheek-teeth except $\overline{\text{m. 3}}$, which appears to have been absent[2]; from Deborah's Den Cave, Gower, Glamorganshire[3]. This specimen has been described by Falconer in a note pub-

[1] The plates are lettered *U. arctos*.

[2] The jaw has been chiselled away at this point.

[3] For the position of this cave see 'Falconer's Palæontological Memoirs,' vol. ii. p. 467.

lished in the 'Palæontological Memoirs,' vol. ii. p. 467, where it is also figured, pl. xxxvi. figs, 3, 4; the alveolus of $\overline{\text{pm. 3}}$ is present. This specimen is remarkable for the excessive width and shortness of $\overline{\text{m. 2}}$, which led Falconer to believe that it could not be referred to any species of Bear with which he was acquainted. This width is, however, scarcely greater than that of the corresponding tooth in No. 47678, from which it may be inferred that the present specimen perhaps belonged to the present species, if the Gibraltar specimens belong to the same. The present specimen is, however, very different from typical forms of *U. horribilis*; and if it belongs to that species it indicates a great range of variation. Its molar is very similar to that of *U. arctos*, No. M. 231.

Presented by Gen. Wood, 1865.

16816. Two canines, probably belonging to this species; from Kent's-Hole Cavern, Torquay.

McEnery Collection. Purchased, 1842.

21671. Fragment of the right ramus of the mandible, containing the two last molars; from the Pleistocene of Grays, Essex.

Purchased, 1848.

28079. Distal extremity of the mandible, containing both canines; from the Pleistocene of Grays. *Purchased*, 1848.

16816. Canine, probably belonging to this species; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

M. 267. (*Fig.*) Fragment of the mandible containing the canine; from the Pleistocene of Grays. This specimen is figured by Morris in the Ann. Mag. Nat. Hist. for 1838, p. 543, under the name of *U. spelæus*; but there seems little doubt that it belongs to the present species.

Purchased from Prof. Morris.

M. 1624. Cast of a fragment of the left maxilla, containing the second and third true molars. The original of this specimen is from an ossiferous fissure at Windy Knoll, near Castleton, Derbyshire [1]. *Presented by Prof. Boyd Dawkins.*

15922, 16731. Two rami of the mandible; from Kent's-Hole Cavern.

McEnery Collection. Purchased, 1842.

[1] See Boyd Dawkins, Quart. Journ. Geol. Soc. vols. xxxi. p. 246, xxxiii. p. 724.

48733. A canine; from Brixham Cave, near Torquay. This specimen is figured by Busk in the Phil. Trans. for 1873, and is provisionally referred to the present species. (*Fig.*)

Brixham-Cave Collection. Presented, 1876.

44926. The glenoidal extremity of the left scapula; from the Pleistocene of Ilford, Essex[1]. This specimen is No. B. 4 of Davies's 'Catalogue of the Brady Collection' (1874).

Brady Collection. Purchased, 1878.

21287. The left humerus; from the Pleistocene of Grays, Essex.

Purchased, 1848.

21288. The distal extremity of the right humerus; from the Pleistocene of Grays. This specimen is of unusually large dimensions.

Purchased, 1848.

38512. The left ulna; from the Pleistocene of Ilford.

Purchased, 1848.

24361. The left ulna; from Pleistocene beds in a railway-cutting near Kew Bridge. This specimen is of very large size, but in its slender form agrees with the last example.

Presented by T. Layton, Esq., 1849.

47683. The proximal half of the left ulna; from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. vi. fig. 1; its specific reference is provisional. (*Fig.*)

Brome Collection. Presented, 1876.

44927. The distal extremity of the right radius; from the Pleistocene of Ilford, Essex. This specimen is No. B. 5 of Davies's 'Catalogue of the Brady Collection.'

Brady Collection. Purchased, 1878.

16852. The right radius: from Kent's-Hole Cavern, Torquay. The reference of this specimen is provisional; but it differs from the radius of *U. spelæus* by its more elongated form.

McEnery Collection. Purchased, 1842.

24961. The left scapho-lunar; from the Pleistocene of Grays, Essex.

Presented by D. Sharpe, Esq., 1850.

[1] This and the other specimens of Ursine remains from the Ilford brick-earth are only provisionally referred to the present species, as it is said that *Ursus arctos* also occurs there. The complete tibia noticed below agrees so closely with that of *U. horribilis*, that on this account, as well as from the circumstance of the common occurrence of that species in the Pleistocene of Grays, the Ilford remains are provisionally referred to *U. horribilis* rather than to *U. arctos*.

46787. (*Fig.*) Five metacarpals; from the caverns of Gibraltar. These specimens are figured by Busk in the Trans. Zool. Soc. vol. x. pl. vi.; the specific reference is provisional.
Brome Collection. Presented, 1876.

18982. The second and third right metacarpals; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

44925. A fragment of the right innominate; from the Pleistocene of Ilford. This specimen comprises the entire ischium and part of the acetabulum; it is No. B. 3 of Davies's 'Catalogue of the Brady Collection.'
Brady Collection. Purchased, 1878.

44928. The right tibia; from the Pleistocene of Ilford. This very perfect specimen is No. B. 6 of Davies's 'Catalogue of the Brady Collection,' where its dimensions are given. It is there referred to *Ursus*.
Brady Collection. Purchased, 1878.

44929. The distal extremity of the left tibia; from the Pleistocene of Ilford. This specimen, of which the articular surface is perfect, is No. B. 5 of the Catalogue cited.
Brady Collection. Purchased, 1878.

44930. A terminal phalangeal; from the Pleistocene of Ilford. This specimen is No. B. 8 of Davies's 'Catalogue.'
Brady Collection. Purchased, 1878.

19834. The axis vertebra; from the Pleistocene of Grays, Essex.
Purchased, 1846.

47680. (*Fig.*) The axis vertebra; from a cavern in Windmill Hill, Gibraltar. This specimen is figured by Busk in the Trans. Zool. Soc. vol. x. pl. vi. figs. 7, 8, 9; the specific reference is provisional. *Brome Collection. Presented*, 1876.

24966. A cervical vertebra; from the Pleistocene of Grays.
Presented by D. Sharpe, Esq., 1850.

44923. A late dorsal vertebra; from the Pleistocene of Ilford. The prezygapophyses and neural spine are imperfect. This specimen is No. B. 1 of Davies's 'Catalogue of the Brady Collection.' *Brady Collection. Purchased*, 1878.

44924. Part of a lumbar vertebra, of which only the centrum is perfect; from the Pleistocene of Ilford. This specimen is No. B. 2 of Davies's 'Catalogue.'
Brady Collection. Purchased, 1878.

27985. The third left metacarpal, probably belonging to the present (*Fig.*) species; from the Pleistocene of Copford, Essex. This specimen is figured by Brown in the Quart. Journ. Geol. Soc. vol. viii. p. 187 (1852).

Presented by J. Brown, Esq., 1852.

22031. Numerous teeth; from the Pleistocene of Grays.

Purchased, 1848.

Ursus arctos, Linn.[1]

Syn. At least for palæontological purposes the following forms must be grouped under this species, viz.:—

Ursus cadavarinus, Eversmann.
Ursus collaris, F. Cuvier.
(?) *Ursus eversmanni*, Gray.
Ursus falcularis, Reichenbach.
Ursus formicarius, Eversmann.
Ursus fuscus, Alb. Magnus.
Var. a. *Ursus isabellinus*, Horsfield.
Ursus lasiotis, Gray.
Ursus piscator, Pucheran.
(? Var.) *Ursus leuconyx*, Severztoff.
Ursus longirostris, Schinz.
Ursus niger, Goldfuss.
Ursus norveygicus, F. Cuvier.
(? Var.) *Ursus pruinosus*, Blyth.
Ursus pyrenaicus, F. Cuvier.
Var. b. *Ursus syriacus*, Ehrenberg.
(?) *Myrmarctos eversmanni*, Gray.

According to Busk $\overline{\text{pm. 4}}$ is very small, and the inner posterior cusp generally absent, and if present very small; it is, however, fairly well developed in one recent skull (B.M. No. 218 *f.*). It appears to be almost, if not quite, impossible to distinguish this species by the dentition[2] alone from *U. horribilis*.

Hab. Europe and Northern Asia.

40405. Part of the right maxilla and premaxilla, containing the outer incisor, canine, and the last four cheek-teeth. This specimen is of large size; and is mentioned by Owen in the 'British Fossil Mammals and Birds,' p. 78, on whose authority it is referred to the present species.

Presented by Sir P. de M. Grey Egerton, Bart., 1867.

[1] Syst. Nat. ed. 12, vol. i. p. 69 (1766).

[2] In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 208, the writer has stated that $\overline{\text{m. 2}}$ is as long as the two preceding teeth; this is, however, by no means invariably the case.

M 231. (*Fig.*) The left ramus of the mandible, containing the canine, pm. 4, and m. 2, together with the alveoli of the other cheek-teeth (including pm. 3); from Manea Fen, Cambridgeshire. This fine specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 106, fig. 35 A. It is of large size; m. 2 is relatively wide, and very like the corresponding tooth of No. 40909 (*U. horribilis*?); there is no inner cusp to pm. 4.

Enniskillen Collection. Purchased, 1882.

48732. (*Fig.*) A canine; from Brixham Cave, near Torquay. This specimen is figured by Busk in the Phil. Trans. for 1873, pl. xlvi. fig. 4, where it is provisionally referred to the present species. *Brixham-Cave Collection. Presented*, 1876.

48754. (*Fig.*) A canine; from Brixham Cave. This specimen is figured by Busk, *op. cit.* pl. xlvi. fig. 3, and is provisionally referred to the present species.

Brixham-Cave Collection. Presented, 1876.

48755. A canine; from Brixham Cave. This specimen is provisionally referred to the present species.

Brixham-Cave Collection. Presented, 1876.

48752–3. The right ramus of the mandible, containing the canine and the last premolar, and showing the alveoli of the other cheek-teeth (including pm. 1 and pm. 3); and a fragment of the right maxilla, with the two true molars, in a much-worn condition, together with the last premolar; from Brixham Cave. From its small size and especially the form of the canine, it is probable that this specimen belongs to the present species. There is a small inner cusp to pm. 4. *Brixham-Cave Collection. Presented*, 1876.

48787. The right ramus of the mandible, containing the canine and the second true molar; from Brixham Cave. The molar is very wide, and there remain the sockets of pm. 1 and pm. 2, although there is no trace of that of pm. 3, which is a very unusual condition. It is doubtful whether this specimen belongs to *U. horribilis* or *U. arctos*.

Brixham-Cave Collection. Presented, 1876.

48832, 48744, 48801. Part of the radius and two humeri of a Bear; from Brixham Cave. These specimens may possibly belong to the present species.

Brixham-Cave Collection. Presented, 1876.

Ursus arvernensis, Croizet and Jobert[1].

Syn. *Ursus minimus,* Dev. and Boriel.
Ursus minutus, P. Gervais.

Hab. France.

28879. Cast of the right ramus of the mandible, showing the canine and the last four cheek-teeth; the original is from the Upper Pliocene of Puy-de-Dôme, France. The alveoli of the first three premolars are present; there is no inner cusp to pm. 4, and the interval between that tooth and the canine is relatively smaller than is usually the case in *U. arctos.* *No history.*

27648. Fragment of the left maxilla, containing the last true molar; from the Pliocene of Ardé, France.
Croizet Collection. Purchased, 1848.

Ursus namadicus, Falconer and Cautley[2].

Hab. India.

39720. (*Fig.*) Part of the right maxilla, containing the last three cheek-teeth and the broken base of pm. 3; from the Pleistocene of the Narbada valley, India. This specimen, which is the type of the species, is figured by Falconer and Cautley in plate O of the 'Fauna Antiqua Sivalensis,' and by Murchison in vol. i. pl. xxvi. fig. 5, of 'Falconer's Palæontological Memoirs'; it is described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 216, pl. xxviii. fig. 3. As far as can be judged from the extremely imperfect remains at present available, this species seems on the whole to have approached nearest to the existing *Ursus malayanus,* but is distinguished by its superior size, and the form and relative dimensions of pm. 3, pm. 4, and m. 2. It is impossible to say at present whether or no the one form may be regarded as on the direct line of descent of the other.
Presented by Gen. Sir W. E. Baker, K.C.B., 1848.

39727. (*Fig.*) The left tibia; from the Pleistocene of the Narbada valley. This specimen is mentioned[3] and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 218, pl. xxix. figs. 3, 3 *a.*
Presented by C. Fraser, Esq. Before 1843.

[1] 'Ossemens Fossiles du Puy-de-Dôme', p. 188 (1828).
[2] In 'Falconer's Palæontological Memoirs,' vol. i. p. 552 (1868).
[3] The number is erroneously given as 39729.

Ursus americanus, Pallas[1].

Hab. North America.

40849. Fragment of the right maxilla, containing the second true molar; from "Big-bone Lick," Kentucky, U.S.A.
Presented by C. Falconer, Esq., 1867.

Family MUSTELIDÆ.

Genus **MUSTELA**, Linn.[2]

[Including the subgenera *Mustela*, Cuvier (*Martes*, Nilsson), and *Putorius*, Cuvier (*Mustela*, Nilsson), and the genus *Plesiogale*, Pomel[3].]

Dentition.—The existing species of the subgenus *Mustela* have the following dental formula, viz., I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$; but in those belonging to *Putorius* the number of the premolars is only $\frac{3}{3}$. In some species belonging to the so-called *Plesiogale* the dental formula, according to Filhol (Ann. Sci. Géol. vol. x. art. 3, p. 177), is I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{1}{2}$, the number of premolars being in the upper jaw the same as in *Mustela* proper, and in the lower as in *Putorius*. If, as is done by Filhol in the work cited, the genus *Plesiogale*[4] is united with *Mustela* (in its wide sense), it appears that for palæontological purposes it is impossible to maintain the subgenera *Mustela* and *Putorius*, and all the forms are consequently included in *Mustela*. The dental formula of the genus as thus extended will be I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{(3-4)}$, M. $\frac{1}{2}$. In the living species of *Mustela* proper the inner cusp is generally well developed in $\overline{\text{m. 1}}$, but it is usually absent in *Putorius*.

Mustela martes, Linn.[5]

Syn. *Martes sylvatica*, Nilsson.

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$.

Hab. Northern Europe.

[1] Spicilegia Zoologica, vol. xiv. p. 6 (1780).

[2] Syst. Nat. ed. 12, vol. i. p. 66 (1766).

[3] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 380 (1846).

[4] In his earlier work on the Quercy Phosphorites (Ann. Sci. Géol. vol. vii. art. 7, pp. 42–45) Filhol maintains the genus *Plesiogale*. The first species so named (*P. mutabilis*) was, however, subsequently referred to *Palæoprionodon* (*vide suprà*, p. 94); and in the Ann. Sci. Géol. vol. x. art. 3, species such as *P. waterhousei*, *P. angustifrons*, and *P. mustelina* are all referred to *Mustela*, although the generic term *Plesiogale* is retained in the description of the plates.

[5] Syst. Nat. ed. 12, vol. i. p. 67 (1766).

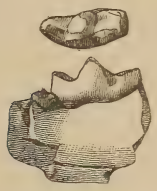
22 (O. C.). The left ramus of the mandible, wanting the incisors, canine, and $\overline{\text{m. 2}}$; from a cavern in Sundwig, Westphalia. *Sömmering Collection. Purchased*, 1827.

Mustela, sp.

Hab. India.

15914. (*Fig.*) Fragment of the left ramus of the mandible, containing the carnassial and the broken $\overline{\text{pm. 4}}$; from the Pliocene of the Siwalik Hills, India. In this specimen, which is represented in the accompanying woodcut (fig. 25), the form of

Fig. 25.



Mustela, sp.—Fragment of the left ramus of the mandible; from the Siwalik Hills. ½.

the carnassial is precisely that of the corresponding tooth of *Mustela* proper, so that it may be safely referred to that genus. In size the two remaining teeth, as well as the ramus itself, agree almost exactly with the mandible of the living Indian *M. flavigula*; but the carnassial of the fossil is readily distinguished by the larger size of the inner cusp, and the greater development of the talon, which is relatively longer than in the existing species, being wider than any other part of the tooth. The inner portion of the talon has a distinct rim, which is wanting in the existing species, thus causing the talon to be slightly basin-shaped. These differences indicate that the Siwalik form is, in all probability, specifically distinct from *M. flavigula*. In the form of the carnassial and in general size the specimen is very close to *M. martes*; but the last premolar is considerably shorter than in that species. No other living species appears to come nearer to the fossil.

Turning to fossil species, the Siwalik jaw is distinguished from that of the Pikermi *M. penteleci*, Gaudry [1],

[1] Animaux fossiles et Géologie de l'Attique, p. 42, pl. vi. figs. 3, 4.

by the larger size of the talon of the carnassial, and the lesser vertical depth of the horizontal ramus. *M. elongata*, P. Gervais[1], of the Lower Pliocene of Montpellier, is of considerably smaller size, but agrees in having a relatively long and basin-shaped talon to the carnassial; this talon is, however, proportionately narrower, and the inner cusp of the blade is larger and placed more posteriorly, causing the "cusp-line" to be more oblique. The mandible figured by P. Gervais[2] under the name of *M. minuta* is at once distinguished by its diminutive size. The mandible of *M. ardea*[3], Bravard, agrees very closely in size, but the talon of the carnassial appears relatively smaller; the inner aspect of this tooth is not figured. *M. taxodon*, P. Gervais[4], has the talon of the carnassial still larger and more distinctly basin-shaped; and it is highly probable that this form should really be referred to a new genus allied to *Meles*. *M. incerta*[5], Lartet, of Sansan, even if it really belong to the present genus, is distinguished by its greatly superior size. The so-called *M. hydrocyon*, P. Gervais[6] (*Hydrocyon sansaniensis*, Lart.), is slightly larger, and the ramus of the mandible relatively deeper—its depth exceeding, instead of being less than, the length of the carnassial; the inner border of the crown of that tooth is also higher. The insufficiently described *M. zorilloides*[7], Lartet, from Sansan, seems to be of smaller dimensions. A species said to be allied to the Martens has been described by Filhol[8], from the Quercy phosphorites, under the name of *M. felina*, which is sufficiently distinguished from the present specimen by the absence of an inner cusp to the lower carnassial. *M. angustifrons* and *M. sectoria*, P. Gervais, are considerably smaller; and it does not appear that any others of the described fossil forms approach the Siwalik jaw. The lower carnassial of the allied genus *Plesictis* is distinguished by the much larger development of the inner cusp.

It thus seems that the present specimen indicates the existence of a species of *Mustela* in the Siwaliks closely

[1] Zool. et Pal. Françaises, 2nd ed. p. 248, pl. xxii. fig. 2.
[2] *Ibid.* pl. xxviii. fig. 4.
[3] *Ibid.* pl. xxvii. fig. 5.
[4] *Ibid.* p. 249, pl. xxiii. fig. 1.
[5] *Ibid.* pl. xxiii. fig. 3.
[6] *Ibid.* p. 248, pl. xxiii. fig. 2.
[7] *Vide* P. Gervais, *op. cit.* p. 251.
[8] Bull. Soc. Philom. Paris, ser. 6, vol. x. p. 87 (1874); and Ann. Sci. Géol. vol. viii. art. 1, p. 39 (1877).

allied to the existing Martens, and probably belonging to a new species. The specimen is, however, too imperfect to allow of its specific characters being fully determined, and it is therefore inadvisable that it should receive a distinct name. *Cautley Collection.* *Presented*, 1842.

Mustela putorius, Linn.[1]

Syn. *Putorius vulgaris*, Owen [2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{1}{2}$.

Hab. Northern Europe and Asia.

48892. The cranium, wanting the zygomatic arches, and many of the teeth; from Brixham Cave, near Torquay.
Brixham-Cave Collection. *Presented*, 1876.

48893. The mandible; from Brixham Cave.
Brixham-Cave Collection. *Presented*, 1876.

48893 a. Fragment of the right ramus of the mandible, containing the last two premolars and the carnassial; from the Coralline Crag of Orford, Suffolk. There does not appear to be any evidence to show whether this specimen is a true Crag fossil, or whether it has been introduced into that deposit.
Presented by Dr. H. Woodward.

48914, 48921, 48922. Numerous limb-bones; from Brixham Cave.
Brixham-Cave Collection. *Presented*, 1876.

48894. Six vertebræ and the sacrum; from Brixham Cave.
Brixham-Cave Collection. *Presented*, 1876.

Mustela vulgaris, Erxleben [3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{1}{2}$.

Hab. Northern Europe, Asia, and America.

48899, 48900. The right and left rami of the mandible; from Brixham Cave, near Torquay.
Brixham-Cave Collection. *Presented*, 1876.

[1] Syst. Nat. ed. 12, vol. i. p. 67 (1766).
[2] Brit. Foss. Mamm. and Birds, p. 112 (1846).
[3] Syst. Reg. Animal, p. 471 (1777).

Mustela erminea, Linn.[1]

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{1}{2}$.

Hab. Northern Europe, Asia, and America.

16709. (*Fig.*) The anterior portion of the cranium, wanting the canines; from Kent's-Hole Cavern, Torquay. This specimen is described and figured, from the palatal aspect, by Owen in the 'British Fossil Mammals and Birds,' p. 118, fig. 42. *McEnery Collection. Purchased*, 1842.

16709 a. (*Fig.*) The cranium and mandible; from a cave at Berry Head, Devonshire. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' pp. 116, 118, figs. 40, 41. (?) *Presented by — Bartlett, Esq.*[2]

Mustela angustifrons (Pomel[3]).

Syn. *Plesiogale angustifrons*, Pomel[4].
Plesiogale pomeli, Laurillard[5].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{4}$, M. $\frac{1}{2}$ (*teste* Filhol).

Hab. France.

26703. (*Fig.*) The greater portion of the cranium, imperfect posteriorly; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen is the type of the species, and is figured by Pomel in the Bull. Soc. Géol. France, ser. 2, vol. iv. pl. iv. fig. 3 (p. 513). It contains all the teeth except the right pm. 1 and both the penultimate upper premolars. *Pomel Collection. Purchased*, 1851.

31010. The greater part of the left ramus of the mandible, showing all the cheek-teeth and the broken canine; from the Lower Miocene of Allier, France. This specimen appears to agree exactly with the one figured under the same name by Filhol in the Ann. Sci. Géol. vol. x. pl. xxv. figs. 15, 16. There is no inner cusp to the carnassial. *Bravard Collection. Purchased*, 1852.

[1] Syst. Nat. ed. 12, vol. i. p. 68 (1776). [2] *Vide* Owen, *loc. cit.*
[3] Bull. Soc. Géol. France. ser. 2, vol. iv. p. 385 (1846), *Plesiogale*: for a full description of this species see Filhol, Ann. Sci. Géol. vol. x. art. 3, p. 177.
[4] *Loc. cit.* [5] Dict. Univ. d'Hist. Nat. vol. x. p. 268.

Mustela sectoria, Gervais[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$.

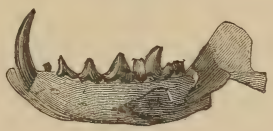
Hab. France.

27822. Portion of the cranium, in a much-crushed condition, but exhibiting the palate and cheek-teeth; from the Lower Miocene of Cournon (Puy-de-Dôme), France. This specimen, together with the next, is the type of the species. It is described by P. Gervais in the passage cited, and also on page 250 of the 2nd edition of the same work. "The carnassial has a length of 0,068, and the tubercular molar is larger externally than internally, forming a triangle of which the external border of the crown is the base. This tooth is also remarkable by the presence on the anterior border of a transverse subtrenchant crest." The first premolar is very minute.

Pomel Collection. Purchased, 1851.

27816. (*Fig.*) The left ramus of the mandible, showing the outer aspect of all the teeth; from the Lower Miocene of Cournon. This

Fig. 26.



Mustela sectoria. The left ramus of the mandible; from the Lower Miocene of Cournon, Puy-de-Dôme. $\frac{1}{1}$.

specimen is described with the last in the passages cited, and is figured in the accompanying woodcut (fig. 26). There are four premolars, the first of which is extremely minute; the space occupied by the six cheek-teeth is 0,019; the length of the carnassial is 0,0055, and that of $\overline{\text{m. 2}}$ 0,002. *Pomel Collection. Purchased*, 1851.

Mustela mustelina (Pomel[2]).

Syn. *Plesiogale mustelina*, Pomel[3].

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[1] Zool. et Pal. Françaises, 1st ed., explanation of pl. xxviii. p. 10 (1848–52).
[2] Catalogue Méthodique, p. 49 (1853), *Plesiogale*. [3] *Loc. cit.*

Dentition :—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{1}{2}$. This species is about the size of the existing Stoat.

Hab. France.

31018. Anterior portion of the cranium of an immature individual, wanting all the teeth except the milk and permanent carnassials, the latter of which is just protruding on the left side; from the Lower Miocene of Allier, France. This specimen appears to be precisely similar to the one figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xxv. figs. 1, 4. *Bravard Collection. Purchased*, 1852.

31019. Fragment of the right ramus of the mandible, containing the last two premolars and the carnassial; from the Lower Miocene of Allier. This specimen is precisely similar to the one figured by Filhol in figs. 6 and 7 of the plate quoted above. *Bravard Collection. Purchased*, 1852.

Mustela waterhousei (Pomel [1]).

Syn. *Plesiogale waterhousei*, Pomel [2].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{?}{4}$, M. $\frac{?}{2}$.

Hab. France.

27815. (*Fig.*) Fragment of the left ramus of the mandible, containing the two last premolars and the carnassial, of which the inner cusp is broken off; from the Lower Miocene of Ronzon (Puy-en-Velay), France. This specimen is the type of the species, and is described by Pomel in the following words:—"Espèce un peu plus petite que le putois, remarquable par l'acuité des avant-molaires inférieures. Cette espèce et la suivante [*M. mustelina*] nous montrent que l'apophyse coronoïde est très-élargie au soumet et comme terminée en fer de hache. La grande étendue de la fosse massétérine achève d'indiquer une très-grande force dans l'appareil musculaire qui mouvait les mâchoires". It would appear that the coronoid process has been broken off since the time of Pomel's description. In the Ann. Sci. Géol. vol. x. art. 3, p. 183, pl. xxv. fig. 10, Filhol describes and figures a right ramus of the mandible from

[1] Catalogue Méthodique, p. 49 (1853), *Plesiogale*. [2] *Loc. cit.*

St. Gérand-le-Puy, which he refers to the same species; he mentions that he was unable to find the present specimen, which was not labelled at the time of his visit to the British Museum. The specimen figured by Filhol appears very similar to the present specimen, but the blade of the carnassial is slightly longer.

Croizet Collection. *Purchased*, 1848.

Mustela ?, sp.

Hab. France.

M. 1366. The greater part of the palatal portion of the cranium, showing the canine and all the cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen is rather larger than the cranium of *M. angustifrons*, from which it is also distinguished by a great difference in the form of m. 1. *Purchased*, 1884.

M. 1375. The right ramus of the mandible, showing pm. 3 and the alveoli of all the other teeth; from the Upper Eocene of Caylux. It is not improbable that this specimen may belong to the same species as the last. *Purchased*, 1884.

Mustela, sp.

18232-4. The third lower premolar and the carnassial of a small specise; from the Pleistocene of Suffolk. The carnassial is intermediate between that of *M. ermineus* and *M. vulgaris*. *Green Collection.* *Purchased*, 1843.

Genus **PLESICTIS,** Pomel[1].

Dentition :—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$. This genus is distinguished from *Mustela* by the circumstance that the temporal ridges of the cranium do not unite to form a sagittal crest. The lower carnassial is always furnished with a well-developed inner cusp, and the upper true molar is distinguished from that of existing species of *Mustela* by its triangular form, but is very similar to that of *M. angustifrons*. In the above-mentioned general characters the genus indicates viverrine tendencies, and the transition to the extinct genus *Stenoplesictis* (page 96) is so gradual that the viverrine and musteline families are practically united by the two genera.

[1] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 379 (1846).

Plesictis palustris, Pomel[1].

Syn. *P. elegans*, Pomel (var.).
P. genetoides, Pomel (var.).

Hab. France.

31024. The hinder portion of the cranium, exhibiting the third and fourth premolars of the left side; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen appears almost identical with a cranium, from the same locality, figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xx. figs. 8–10; the only difference between the two being that the temporal ridges are more widely separated in the present specimen; these differences, are, however, probably due to differences in age.

Bravard Collection. Purchased, 1852.

31025. Fragment of the right maxilla, containing the carnassial and the alveolus of $\underline{\text{m. 1}}$; from the Lower Miocene of St. Gérand-le-Puy. *Bravard Collection. Purchased*, 1852.

24943. The greater portion of the right ramus of the mandible, containing $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$, and the alveoli of the other cheek-teeth and canine; from the Lower Miocene of St. Gérand-le-Puy. This specimen appears to be precisely similar to a left ramus figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xxii. fig. 2.

Presented by — Talbot, Esq., 1849.

Plesictis croizeti, Pomel[2].

Syn. ? *P. robusta*, Pomel.
? *P. gracilis*, Pomel.

Hab. France.

This species was originally described in 1846 by Pomel, on the evidence of the mandible catalogued below (No. 26702). Filhol unites, in the Ann. Sci. Géol. vol. x. art. 3, p. 124 *et seq.*, this species with *P. robusta* and *P. gracilis*, taking *P. robusta* as the name of the species. As, however, those names were not published till 1853 ('Catalogue Méthodique,' p. 60), it is evident that the

[1] Catalogue Méthodique, p. 62 (1853). See also Filhol, Ann. Sci. Géol. vol. x. art. 3, p. 144 *et seq.*, on whose authority the synonymy is given.

[2] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 385 (1846).

name *croizeti* should stand for the species, on the assumption that the three forms are the same. In his quotations from Pomel, Filhol (p. 131) has, however, given Pomel's description of *P. lemanensis* as that of *P. croizeti*, and that of *P. croizeti* (p. 134) as that of *P. lemanensis*. According to Pomel's original description, it is *P. lemanensis* that is stouter than *P. croizeti*; but as Filhol has reversed the two descriptions, it of course happens that *P. croizeti* is the stouter species according to him. It appears, however, that the stouter type of skull figured by Filhol under the name of *P. robusta*, var. *croizeti*, does agree more nearly in relative size with the type mandible of *P. croizeti*, Pom., than does the slighter skull figured by Filhol under the name of *P. lemanensis*; and it therefore seems well to provisionally adopt Filhol's identifications, although they appear founded on a misconception. On this view *P. croizeti* will be (contrary to Pomel's original definition) a larger species than *P. lemanensis*.

26702. (*Fig.*) The greater portion of the right ramus of the mandible, containing the last two premolars and the carnassial, and the alveoli of the other cheek-teeth and the canine; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen is the type of the species, and is figured by Pomel in the Bull. Soc. Géol. France, ser. 2, vol. iv. pl. iv. fig. 4. *Pomel Collection. Purchased*, 1851.

31022. The hinder part of the cranium, containing the left true molar; from the Lower Miocene of St. Gérand-le-Puy. This specimen agrees with the cranium figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xxi. figs. 3, 4, 5, with the exception that the temporal ridges are less closely approximated, this character probably depending to a great extent on age. As mentioned above, these two specimens may be provisionally referred to the present species.

Bravard Collection. Purchased, 1852.

Plesictis lemanensis, Pomel[1].

For the doubt as to the correct identification of this species see above under the head of *P. croizeti*.

Hab. France.

31028. Fragment of the right ramus of the mandible, containing

[1] Catalogue Méthodique, p. 61 (1853).

the carnassial and the alveolus of $\overline{\text{m. 2}}$; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen appears to be very similar to the one figured under the above name by Filhol in the Ann. Sci. Géol. vol. x. pl. xxii. fig. 3. *Bravard Collection. Purchased*, 1852.

Plesictis (?), sp.

Hab. Italy.

31028, a. Fragment of the right ramus of the mandible, containing the two true molars; from the Upper Pliocene of the Val d'Arno di Sopra, Italy. This specimen is larger than any of those mentioned above, and not improbably indicates a new species. *Presented by the Earl of Enniskillen.*

Limb-bones and Vertebræ of undetermined species of MUSTELA *or allied* GENUS.

From the Lower Miocene of St. Gérand-le-Puy (Allier), France. *Bravard Collection.*

31012. The glenoidal part of the scapula.

31029–30. Two humeri, of the same size. These bones have an ent-epicondylar foramen, and differ thereby from living species of *Mustela*.

31013–4. The proximal halves of two ulnæ.

31015. The distal half of the radius.

31016. The distal half of the femur of a large species.

26704. The greater portion of the tibia.

31021. The tibia, of smaller size than the last.

31011. A lumbar vertebra, of large size.

31020. A cervical vertebra, of small size.

Genus **GULO**, Storr[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$. In one of the specimens noticed below $\overline{\text{m. 2}}$ is wanting.

[1] Prodromus Meth. Mamm. p. 34 (1780).

Gulo luscus (Linn.[1]).

Syn. *Mustela gulo*, Linn.[2]
Ursus luscus, Linn.[3]
Gulo borealis, Nilsson (*teste* Wagner).
Gulo spelæus, Goldfuss[4].

Hab. Northern Europe and America.

21 (O. C.). The cranium and mandible; from the Gailenreuth (?) Cave, Franconia. The cranium wants the zygomatic arches, and the carnassials and canines; the mandible has lost the summit of the coronoid process of either side. *Sömmering Collection.* *Purchased*, 1827.

28556. The left ramus of the mandible, containing the last three premolars and the carnassial; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

28556 a. Part of the right ramus of the mandible, containing all the cheek-teeth except $\overline{\text{pm. 1}}$; from a cavern in Sundwig, Westphalia. *Purchased*, 1853.

M. 227. Part of the left ramus of the mandible, containing $\overline{\text{pm. 3}}$, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$, in a well-worn condition; from the Gailenreuth Cave. *Enniskillen Collection.* *Purchased*, 1882.

M. 228. Fragment of the left ramus of the mandible, containing the last premolar and the carnassial, in a very much worn condition; from the Gailenreuth Cave. This specimen is remarkable for the circumstance that there is not the slightest trace of the alveolus of the second true molar. *Enniskillen Collection.* *Purchased*, 1882.

M. 228 a. Part of the left ramus of the mandible, containing the last $\overline{\text{pm. 3}}$, $\overline{\text{pm. 4}}$, and $\overline{\text{m. 1}}$, in an unworn condition; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

M. 228 b. Fragment of the left ramus of the mandible, containing the unworn last premolar; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

M. 229 a. The distal two-thirds of the right humerus, exhibiting the entepicondylar foramen; from the Gailenreuth Cave. *Egerton Collection.* *Purchased*, 1882.

[1] Syst. Nat. ed. 12, p. 71 (1766), *Ursus*.
[2] *Ibid.* p. 67 (1766).
[3] *Ibid.* p. 71 (1766).
[4] Nova Acta Ac. Cæs. Leop.-Car. vol. ix. p. 319 (1818).

M. 229. The right tibia; from the Gailenreuth Cave.
Enniskillen Collection. *Purchased*, 1882.

M. 229 b. The centrum of the axis vertebra, wanting the odontoid process; from the Gailenreuth Cave.
Egerton Collection. *Purchased*, 1882.

Genus **MELLIVORA**, Storr[1].

Syn. *Ursitaxus*, Hodgson[2].
Ratelus, Bennett[3].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$, M. $\frac{1}{1}$.

Mellivora sivalensis (Falconer and Cautley[4]).

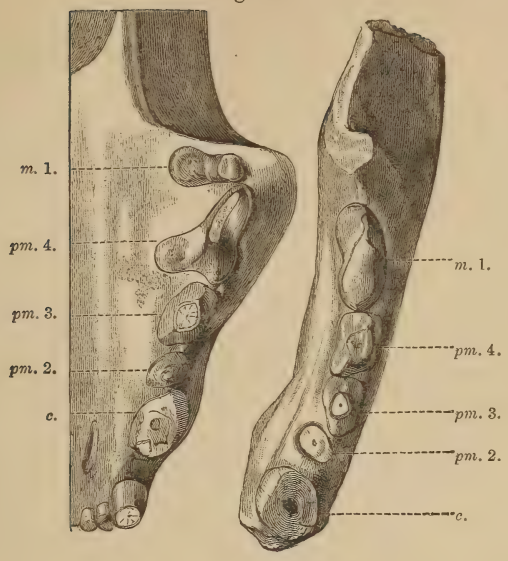
Syn. *Ursitaxus sivalensis*, Falconer and Cautley[5].
Gulo, sp., Baker and Durand[6].

Hab. India.

40184. The cranium; from the Pliocene of the Siwalik Hills, India.
(*Fig.*) This specimen is the type of the species, and is described and figured by Baker and Durand in the Journ. As. Soc. Beng. vol. v. p. 581, pl. xxvii. fig. 1, under the generic name of *Gulo*. It is also figured by Falconer and Cautley in supplemental plate Q of the 'Fauna Antiqua Sivalensis,' figs. 4, 4 *a*, 4 *b*, 4 *c*', under the name of *Ursitaxus*; and is described and figured under the above name by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 180, pl. xxvi. In this specimen all the teeth are shown, but the crowns of the canines are broken off and the cheek-teeth are very much worn. In the accompanying woodcut (fig. 27) there is represented one half of the palatal portion of the cranium and the left ramus of the mandible, also from the Siwalik Hills, which are preserved in the Science and Art Museum, Dublin, and are the only other known remains of the species. These specimens are likewise described by the present writer in the 'Palæontologia Indica'.
Cautley Collection. *Presented*, 1842.

[1] Prodromus Meth. Mamm. p. 34 (1780).
[2] Asiatic Researches, vol. xix. p. 60 (1836).
[3] Gardens &c. Zool. Soc. vol. i. p. 13 (1830).
[4] In 'Falconer's Palæontological Memoirs,' vol. i. p. 553 (1868), *Ursitaxus*
[5] *Loc. cit.*
[6] Journ. As. Soc. Beng. vol. v. p. 581 (1836).

Fig. 27.



b

Mellivora sivalensis. The right half of the palate (*a*) and the left ramus of the mandible (*b*). $\frac{1}{1}$. Dublin Museum. (From the 'Palæontologia Indica.')

Genus **MELES**, Storr[1].

Dentition :—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{2}$.

Meles taxus, Boddaert[2].

Syn. *Ursus meles*, Linn.[3]
Meles vulgaris, Desmarest[4].
Meles vulgaris fossilis, H. von Meyer.

Hab. Europe and Northern Asia.

20 (**O. C.**). The hinder part of the cranium and the left half of the palate, containing the carnassial and the true molar; from a cavern in Sundwig.

Sömmering Collection. Purchased, 1827.

20 a (**O. C.**). The left ramus of the mandible, containing the canine and the carnassial; from a cavern in Sundwig.

Sömmering Collection. Purchased, 1827.

[1] Prodromus Meth. Mamm. p. 34 (1780).
[2] Elenchus Animalium, vol. i. p. 80 (1785).
[3] Syst. Nat. ed. 12. vol. i. p. 70 (1766).
[4] Mammalogie, p. 173 (1820).

20 b (O. C.). The right ramus of the mandible, containing the carnassial; from a cavern in Sundwig, Westphalia.
Sömmering Collection. Purchased, 1827.

16711. (*Fig.*) The left ramus of the mandible, containing all the teeth except the incisors, $\overline{\text{pm. 1}}$, and $\overline{\text{pm. 3}}$; from Kent's-Hole Cavern, Torquay. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 107, fig. 37. The teeth are in an unworn condition, and the alveolus of $\overline{\text{pm. 1}}$ is of minute size.
McEnery Collection. Purchased, 1842.

M. 1884. The cranium and mandible; from a brick-field at Grovehurst, Sittingbourne, Kent. The age of this specimen is doubtful. *Presented by George Payne, Esq.*, 1884.

27659. The distal half of the left humerus (showing the entepicondylar foramen) and the proximal half of the left ulna; from a cavern at Montpellier, France.
Croizet Collection. Purchased, 1848.

Genus **LUTRA**, Erxleben[1] (*ex* Ray).

Including:—*Aonyx*, Lesson.
Enhydriodon (*Amyxodon*), Falconer[2].
Lutrictis, Pomel[3].
Potamotherium, E. Geoffroy[4].
Stephanodon, H. von Meyer[5].

Dentition.—In the typical living forms the dental formula is I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{3}$, M. $\frac{1}{2}$; but in *L.* (*A.*) *leptonyx* the first upper premolar is not unfrequently absent; and in some fossil forms this tooth is invariably wanting. In another fossil species $\underline{\text{m. 2}}$ is present; so that the dental formula for all these variations must be written as follows, viz. I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{(3-4)}{3}$, M. $\frac{(1-2)}{2}$. The reasons for including *Enhydriodon* in the present genus are given by the writer in the 'Palæontologia Indica,' ser 10, vol. ii. pp. 195–201.

[1] Syst. Regn. Animal, p. 445 (1777).
[2] In 'Falconer's Palæontological Memoirs,' vol. i. p. 331 (1868). The name *Amyxodon* dates from 1836, but was never defined.
[3] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 380 (1846).
[4] Revue Encyclopédique, vol. lix. p. 88 (1833).
[5] Neues Jahrbuch, 1847, p. 182; and Suppl. Arch. Sci. Phys. Nat. vol. v. p. 307 (1847).

Lutra vulgaris, Erxleben[1].

Syn. *Mustela lutra*, Linn.[2]
Lutra antiqua, M. de Serres[3].

Hab. Europe and North Asia.

39904. The cranium and mandible, showing all the teeth except the incisors, canines, and m. 2; from Watcham Fen, near Ely, Cambridgeshire. *Purchased*, 1866.

39907. The right scapula; from Watcham Fen. *Purchased*, 1866.

36631. The left humerus, wanting both extremities; from the Pleistocene of Grays, Essex. *Purchased*, 1848.

39908. The right ulna; from Watcham Fen. *Purchased*, 1866.

39468 a. The left ulna; from the fens of Lincolnshire. *Purchased*, 1866.

Lutra palæindica, Falconer and Cautley[4].

Hab. India.

37151. (*Fig.*) Cranium, wanting both zygomatic arches, part of the right maxilla, and all the teeth except pm. 2 and m. 1 of the right side; from the Pliocene of the Siwalik Hills, India. This specimen is the type of the species, and is figured in plate xxvii. figs. 6, 7 of 'Falconer's Palæontological Memoirs,' and in supplemental plate P. fig. 1 of the 'Fauna Antiqua Sivalensis.' It is also described and figured by the writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 191, pl. xxvii. fig. 1. *Cautley Collection. Presented*, 1842.

37152. (*Fig.*) Part of the left ramus of the mandible, wanting all the teeth except the carnassial, of which the blade is broken; from the Pliocene of the Siwalik Hills, India. This specimen is described and figured in the same places as the last specimen. *Cautley Collection. Presented*, 1842.

Lutra dubia, Blainville[5] (*ex* Croizet).

Hab. Europe.

27486. Fragment of the right ramus of the mandible, containing

[1] Syst. Regn. Animal, p. 448 (1777).
[2] Syst. Nat. ed. 12, vol. i. p. 66 (1766).
[3] Ann. d. Muséum, vol. xviii. p. 334.
[4] In 'Falconer's Palæontological Memoirs,' pl. xxvii. (1868).
[5] Ostéographie, genus *Mustela*, p. 67, pl. xiv. (1848?).

the carnassial and the base of $\overline{\text{pm. 4}}$; probably from the Upper Miocene of Eppelsheim, Hesse Darmstadt. This specimen appears to be precisely similar to the type specimen figured by De Blainville (*loc. cit.*), from the Middle Miocene of Sansan (Gers), France. If the locality of the present specimen be correct, it extends the range of the species to Hesse Darmstadt.

Hastings Collection. *Purchased*, 1855.

Lutra campani, Meneghini[1].

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{?}$, M. $\frac{1}{?}$.

Hab. Italy.

37347. Cast of the palatal portion of the cranium. The original is from the Middle Miocene of Monte Bamboli, Tuscany. The original of this specimen, which is the type of the species, is believed to be in the Museum at Pisa, and is described and figured by Meneghini in the Atti Soc. Ital. Sci. Nat. vol. iv. pl. i. A; the right upper carnassial is represented in the accompanying woodcut (fig. 28). The

Fig. 28.

Lutra campani. Right upper carnassial; from the Middle Miocene of Monte Bamboli, Tuscany. $\frac{1}{1}$. (From the 'Palæontologia Indica.')

affinities of the species are alluded to by the present writer in the 'Palæontologia Indica,' vol. ii. p. 198, and are shown to be nearest to those of the next species.

Purchased, 1863.

Lutra sivalensis (Falconer and Cautley[2]).

Syn. *Enhydriodon sivalensis*, Falconer and Cautley[3].
Enhydriodon ferox, Falconer and Cautley.
Amyxodon, sp., Falconer and Cautley.

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[1] Atti Soc. Ital. Sci. Nat. vol. iv. p. 18 (1862).

[2] In 'Falconer's Palæontological Memoirs,' vol. i. p. 331 (1868), *Enhydriodon*. The history and synonymy are given by the present writer in the Palæontologia Indica,' ser. 10, vol. ii. p. 196.

[3] *Loc. cit.*

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{?}$, M. $\frac{1}{2}$.

Hab. India.

37153. The greater part of the cranium, wanting both zygomatic (*Fig.*) arches and part of the premaxillæ; from the Pliocene of the Siwalik Hills, India. This specimen, which, with the two next, is the type of the species, contains the hinder cheek-teeth of the right side, in a broken condition; there is no sign of the presence of pm. 2. It is figured in 'Falconer's Palæontological Memoirs,' vol. i. pl. xxvii. figs. 3, 4, and in supplemental plate P of the 'Fauna Antiqua Sivalensis:' together with the two next specimens it is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. ii. p. 197.

Cautley Collection. Presented, 1842.

37154. The anterior portion of the cranium, exhibiting the alveoli (*Fig.*) or the crowns of all the teeth; from the Pliocene of the Siwalik Hills. This specimen is represented in figs. 1, 2 of the above-mentioned plate of 'Falconer's Palæontological Memoirs' and in plate P of the 'Fauna Antiqua Sivalensis.' It shows the alveolus of pm. 2, which is of extremely minute size, and also that of the outer incisor, which is of relatively large size.

Cautley Collection. Presented, 1842.

37155. The anterior portion of the cranium, showing the alveoli of (*Fig.*) the outer incisors and of the canines, and the broken crowns of the last three cheek-teeth of the left side; from the Pliocene of the Siwalik Hills. This specimen is represented in fig. 5 of the above-mentioned plate of 'Falconer's Palæontological Memoirs,' and in plate P of the 'Fauna Antiqua Sivalensis.' The left upper carnassial of this specimen is represented, of the natural size, in the accompanying woodcut (fig. 29). There is no trace of the alveolus of pm. 2, which tooth was probably absent.

Fig. 29.

Lutra sivalensis. Left upper carnassial, broken on the outer side; from the Siwalik Hills. $\frac{1}{1}$. (From the 'Palæontologia Indica.')

Cautley Collection. Presented, 1842.

Lutra valetoni, E. Geoffroy[1].

Syn. *Potamotherium valetoni*, E. Geoffroy[2].
Lutrictis valetoni, Pomel[3].
Stephanodon mombachiensis, H. von Meyer[4].
Lutra clermontensis, Blainville[5] (*in parte*).

Dentition:—I. $\frac{3}{3}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{2}{2}$.

Hab. Europe.

In his memoir on the Fossil Mammals of St. Gérand-le-Puy[6], Filhol refers this species to the genus *Lutra*; and the present writer is inclined to adopt this view. If it be referred to a distinct genus, the name *Potamotherium* is the correct one[7].

31031. Fragment of the right maxilla and premaxilla, containing the canine and pm. 2; from the Lower Miocene of Allier, France. *Bravard Collection. Purchased*, 1852.

25448. The left ramus of the mandible wanting the proximal extremity, and containing the canine and all the cheek-teeth except m. 2; from the Lower Miocene of Mombach, near Mayence. *Purchased*, 1850.

31032. Hinder portion of the left ramus of the mandible, containing the carnassial; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31033. Fragment of the right ramus of the mandible, containing the carnassial *in alveolo*; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

26699. The left humerus, imperfect superiorly, showing the ent-epicondylar foramen; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. *Pomel Collection. Purchased*, 1851.

31040. The right humerus, wanting the proximal extremity; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852

[1] Revue Encyclopédique, vol. lix. p. 88 (1833). [2] *Loc. cit.*
[3] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 380 (1846).
[4] Neues Jahrb. 1847, p. 182.
[5] Ostéographie, genus *Mustela*, p. 59 (1842?).
[6] Ann. Sci. Géol. vol. x. art. 3, p. 58.
[7] In the 'Palæontologia Indica,' ser. 10, vol. ii. p. 190, the present writer, who had not, at the time of writing the passage, entered into the question of priority, followed Gaudry in referring the present species to Pomel's genus *Lutrictis*.

31041. The proximal extremity of the right humerus; from the Lower Miocene of Allier.
Bravard Collection. Purchased, 1852.

40899–900. Two imperfect specimens of the right humerus; from the Lower Miocene of Allier.
Presented by C. Falconer, Esq., 1867.

26701. The left ulna; from the Lower Miocene of St. Gérand-le-Puy. *Pomel Collection. Purchased*, 1851.

31044. Two specimens of the proximal portion of the right ulna; from the Lower Miocene of Allier.
Bravard Collection. Purchased, 1852.

31045–6–8. Three specimens of the radius; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

26701. The right femur; from the Lower Miocene of St. Gérand-le-Puy. *Pomel Collection. Purchased*, 1851.

31050. The right femur; from the Lower Miocene of Allier.
Bravard Collection. Purchased, 1852.

31053. The proximal half of the left femur; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31053 a. The left calcaneum; from the Lower Miocene of Allier.
Bravard Collection. Purchased, 1852.

31034. The atlas vertebra; from the Lower Miocene of Allier.
Bravard Collection. Purchased, 1852.

31035. The axis vertebra, imperfect posteriorly; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31037–8–9. Three trunk vertebræ; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

Lutra minor (H. von Meyer[1]).

Syn. *Stephanodon minor*, H. von Meyer.

Hab. Europe.

25440. Fragment of the right ramus of the mandible, containing the last premolar and the carnassial; from the Lower Miocene of Mombach, near Mayence. *Purchased*, 1850.

[1] The writer has been unable to find a reference to this species, which may be only a smaller form of the last.

Suborder *CARNIVORA PINNIPEDIA.*

Family OTARIIDÆ.

Genus **OTARIA,** Péron[1]
(including *Arctocephalus*, &c.).

Dentition:—I. $\frac{3}{2}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{(1-2)}{1}$.

Otaria forsteri, Lesson[2].

Syn. *Arctocephalus forsteri,* Gray.

Hab. Australian and New-Zealand seas.

32173. The palatal portion of the cranium, together with numerous limb-bones and vertebræ; from Prehistoric or Pleistocene deposits at Ruamora, South Island, New Zealand. The cranium agrees precisely with the one figured by J. W. Clark in the Proc. Zool. Soc. 1875, pl. lxxii., showing the small cusp on the anterior side only of the cheek-teeth. These remains were associated with those of *Dinornis* and a species of Dog[3]. *Purchased from Walter Mantell, Esq.*

Otaria, sp.

Hab. New Zealand.

32173 a. Fragment of the anterior portion of the cranium of a young male of a large species, containing a canine tooth; from Prehistoric or Pleistocene deposits at Ruamora, South Island, New Zealand. This specimen seems too imperfect for specific identification.

Purchased from Walter Mantell, Esq.

[1] Voyage aux Terres Australes, vol. ii. p. 37, note (1816).

[2] Dict. Class. d'Hist. Nat. vol. xii. p. 421 (1828).

[3] The occurrence of the remains of this genus, associated with those of *Dinornis* and a Dog, in similar deposits is recorded by Haast in 'Nature,' vol. xiv. pp. 577–578 (1876). The name of the smaller Otary there found is given as *Otaria cinerea*; it is, however, not improbable that that form really belongs to the present species, since many crania from New Zealand have been erroneously referred to *O. cinerea* (*vide* J. W. Clark, Proc. Zool. Soc. 1884, p. 196). That species is characterized by the presence of fore-and-aft cusps (talons) to the cheek-teeth, as is well exhibited in the figure on p. 191 of the memoir last quoted.

Family TRICHECHIDÆ.

Genus **TRICHECHUS,** Linn.[1]

Dentition.—In the adult of the existing species it appears that the following teeth are usually present, viz.:—I. $\frac{1}{0}$, C. $\frac{1}{1}$, Pm. $\frac{3}{3}$.

Trichechus rosmarus, Linn.[2]

Syn. *Odobænus rosmarus,* Allen [3] (*ex* Malmgren).

Hab. Arctic Ocean and Northern Europe.

46134. The nearly complete mandible; dredged on the Dogger Bank, Eastern coast. This specimen shows the alveoli of the teeth; it is noticed by W. Davies in the Geol. Mag. dec. 2, vol. v. p. 98 (1878).
Owles Collection. Purchased, 1874.

M. 1133. Cast of the centrum of the twelfth dorsal vertebra. The original is from the Antwerp Crag, and is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. viii. fig. 7 (1877). *Purchased.*

M. 1134. Cast of the right scaphoid. The original is from the Antwerp Crag, and is figured by Van Beneden, *op. cit.* figs. 8, 9. *Purchased.*

Trichechus huxleyi, Lankester[4].

Syn. *Trichechodon huxleyi,* Lankester [5].

This species was originally referred by its founder to the new genus *Trichechodon,* but subsequently (Trans. Linn. Soc. ser. 2, Zool. vol. ii. p. 213 [1882]) to *Trichechus,* the name *Trichechodon* being abolished. By Van Beneden[6] the species is identified with *Alachtherium cretsi,* but this is doubted by Lankester: if correct, the name *huxleyi* has the priority, and *A. cretsi* should be referred to this species.

Hab. Europe.

[1] Syst. Nat. ed. 12, vol. i. p. 49 (1766). [2] *Loc. cit.*
[3] History of North-American Pinnipeds, p. 23 (1880).
[4] Quart. Journ. Geol. Soc. vol. xxi. p. 226 (1865), *Trichechodon.*
Loc. cit.
[6] Ann. Mus. R. Hist. Nat. Belg. vol. i. p. 53 (1877). On page 46, *Trichechodon huxleyi* is given as a synonym of *Trichechodon koninckı.*

46000. (*Fig.*) Fragment of the distal portion of the tusk; from the Red Crag of Suffolk. This specimen is the type, and is described and figured by Lankester in the Quart. Journ. Geol. Soc. vol. xxi. p. 226, pl. x. figs. 1, 5, 6.
Purchased, 1874.

40135. Fragment of the basal portion of a very large tusk; probably from the same locality. *Purchased*, 1866.

44208. Terminal portion of a crushed tusk; from the Red Crag of Suffolk. *Purchased*, 1873.

43175. Fragment of a tusk; from the Red Crag of Suffolk.
Wetherell Collection. *Purchased*, 1871.

46921. Portion of a tusk, cut and polished; from the Red Crag, near Woodbridge, Suffolk. *Purchased*, 1875.

40136. Transverse section of a tusk; from the Red Crag, near Woodbridge. *Purchased*, 1866.

44629. Transverse section of a tusk; from the Red Crag, near Felixstow, Essex. *Purchased*, 1873.

43394. Cast of the basal portion of a tusk of a large male. The original (from the Red Crag of Suffolk) is figured by Lankester in the Quart. Journ. Geol. Soc. vol. xxi. pl. x. fig. 3, and in the Trans. Linn. Soc. ser. 2, Zool. vol. ii. pl. xxii. fig. 3; it is now in the York Museum.
Purchased, 1872.

43395. Cast of the extremity of a tusk, much compressed laterally. The original (from the Red Crag of Suffolk) is figured by Lankester in the Quart. Journ. Geol. Soc. vol. xxi. pl. x. fig. 2, and in the Trans. Linn. Soc. ser. 2, Zool. vol. ii. pl. xxii. fig. 4; it is now in the Ipswich Museum.
Purchased, 1872.

Genus **ALACHTHERIUM,** De Bus[1].

Alachtherium cretsi, De Bus[2].

Hab. Europe.

As mentioned above, this species is identified by Van Beneden with *Trichechus* (*Trichechodon*) *huxleyi*; but this cannot be considered certain. If the two are really the same, the name *huxleyi* has the priority; and if generically distinct from *Trichechus* it seems

[1] Bull. Ac. R. Belg. ser. 2, vol. xxiv. p. 562 (1867). [2] *Loc. cit.*

best that the generic name *Alachtherium* should be applied, as *Trichechodon* has been withdrawn by Lankester and has been used in another sense by Van Beneden. The originals of the casts of *A. cretsi* and the next species were obtained from the Antwerp Crag, and are preserved in the Brussels Museum.

M. 1148. Cast of the hinder portion of the cranium. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. i. fig. 1. *Purchased.*

M. 1166. Cast of the left ramus of the mandible, showing seven teeth. The original is figured by Van Beneden, *op. cit.* pl. iii. figs. 1, 2. *Purchased.*

M. 1151. Cast of the left humerus. The original is figured by Van Beneden, *op. cit.* pl. iii. figs. 1, 2. *Purchased.*

M. 1170. Cast of the distal part of the left ulna. The original is figured by Van Beneden, *op. cit.* pl. ii. fig. 5. *Purchased.*

M. 1169. Cast of the proximal part of the right radius. The original is figured by Van Beneden, *op. cit.* pl. iv. figs. 5, 6. *Purchased.*

M. 1168. Cast of the right humerus of a young individual. The original is figured by Van Beneden, *op. cit.* pl. iv. figs. 3, 4. *Purchased.*

M. 1171. Cast of the left ilium. The original is figured by Van Beneden, *op. cit.* pl. v. fig. 5. *Purchased.*

M. 1172. Cast of the right femur. The original is figured by Van Beneden, *op. cit.* pl. v. figs. 1–3. *Purchased.*

M. 1173. Cast of the left femur of a young animal. The original is figured by Van Beneden, *op. cit.* pl. v. fig. 8. *Purchased.*

M. 1174. Cast of the distal part of the left tibia. The original is figured by Van Beneden, *op. cit.* pl. vi. figs. 1–3. *Purchased.*

M. 1175. Cast of the shaft of the tibia of a young animal. *Purchased.*

M. 1176. Cast of the left astragalus. The original is figured by Van Beneden, *op. cit.* pl. vi. fig. 4. *Purchased.*

M. 1177. Cast of the inner left metacarpal. The original is figured by Van Beneden, *op. cit.* pl. ii. fig. 6. *Purchased.*

M. 1149. Cast of the centrum of the fifth cervical vertebra. The original is figured by Van Beneden, *op. cit.* pl. v. fig. 6. *Purchased.*

M. 1167. Cast of the fourth lumbar vertebra. The original is figured by Van Beneden, *op. cit.* pl. v. fig. 7. *Purchased.*

M. 1150. Cast of the sacrum. The original is figured by Van Beneden, *op. cit.* pl. v. fig. 4. *Purchased.*

Genus **TRICHECHODON,** Van Beneden[1] (*non* Lank.).

Trichechodon koninckii, Van Beneden[2].

Hab. Europe.

Whether this form is really generically distinct from *Trichechus* may be considered doubtful.

M. 1135. Cast of part of the right ramus of the mandible. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. vii. figs. 5–7. *Purchased.*

M. 1140. Cast of the distal part of the left humerus. The original is figured by Van Beneden, *op. cit.* pls. vii. & viii. figs. 1, 2. *Purchased.*

M. 1144–6. Casts of the associated first and second right metacarpals. The originals are figured by Van Beneden, *op. cit.* pl. vii. fig. 6. *Purchased.*

M. 1145. Cast of the first left metacarpal. The original is figured by Van Beneden, *op. cit.* pl. vii. fig. 6. *Purchased.*

M. 1147. Cast of a first phalangeal. The original is figured by Van Beneden, *op. cit.* pl. vii. fig. 7. *Purchased.*

M. 1142. Cast of the calcaneum. The original is figured by Van Beneden, *op. cit.* pl. viii. fig. 6. *Purchased.*

M. 1143. Cast of the astragalus. The original is figured by Van Beneden, *op. cit.* pl. viii. fig. 5. *Purchased.*

[1] Bull. Ac. R. Belg. ser. 2, vol. xxxii. p. 5 (1871).
[2] *Loc. cit.*

M. 1139. Cast of the first rib. The original is figured by Van Beneden, *op. cit.* pl. vii. fig. 5. *Purchased.*

M. 1138. Cast of a portion of the sternum. The original is figured by Van Beneden, *op. cit.* pl. viii. fig. 4. *Purchased.*

M. 1136. Cast of the sixth cervical vertebra (imperfect). The original is figured by Van Beneden, *op. cit.* pl. viii. fig. 3. *Purchased.*

M. 1137. Cast of the sacrum (imperfect). The original is figured by Van Beneden, *op. cit.* pl. vii. fig. 4. *Purchased.*

M. 1141. Cast of the ilium (imperfect). The original is figured by Van Beneden, *op. cit.* pl. vii. fig. 3. *Purchased.*

Family PHOCIDÆ.

Dentition (in existing forms):—I. $\frac{3}{2}$, C. $\frac{1}{1}$, Pm. $\frac{4}{4}$, M. $\frac{1}{1}$.

Genus **MESOTARIA,** Van Beneden [1].

This genus is provisionally referred by its founder to the *Otariidæ*; but Allen, in the 'History of the North-American Pinnipeds,' pp. 217–220 (1880), classes it in the present family.

Mesotaria ambigua, Van Beneden [2].

This species is considered to be allied to the existing *Cystophora cristata*.

Hab.[3] Europe.

M. 1152. Casts of two molars. The originals are figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. ix. figs. 1, 2.

M. 1165. Cast of the left scapula. The original is figured by Van Beneden, *op. cit.* fig. 7.

M. 1155. Cast of the humerus. The original is figured by Van Beneden, *op. cit.* figs. 9, 11.

M. 1156. Cast of the right innominate. The original is figured by Van Beneden, *op. cit.* fig. 8.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 783 (1876). [2] *Loc. cit.*

[3] The originals of the casts of this and the following genera of Seals were obtained from the Antwerp Crag, and are preserved in the Museum at Brussels. The casts were acquired by purchase.

M. 1163. Cast of the left femur. The original is figured by Van Beneden, *op. cit.* figs. 12–14.

M. 1164. Cast of the proximal portion of the left tibia. The original is figured by Van Beneden, *op. cit.* figs. 15, 16.

M. 1153. Cast of the axis vertebra. The original is figured by Van Beneden, *op. cit.* figs. 4, 5.

M. 1154. Cast of a cervical vertebra (imperfect). The original is figured by Van Beneden, *op. cit.* fig. 6.

Genus **PALÆOPHOCA,** Van Beneden [1].

Palæophoca nysti, Van Beneden [2].

This species is allied to the existing *Monachus albiventer*.
Hab. Europe.

M. 1181. Cast of part of the left ramus of the mandible. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. x. figs. 3, 4.

M. 1178. Cast of a canine. The original is figured by Van Beneden, *op. cit.* fig. 7.

M. 1180. Cast of a canine. The original is figured by Van Beneden, *op. cit.* fig. 6.

M. 1179. Cast of a molar. The original is figured by Van Beneden, *op. cit.* fig. 8.

M. 1182. Cast of the right humerus. The original is figured by Van Beneden, *op. cit.* fig. 10.

M. 1183. Cast of part of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 9.

M. 1186. Cast of the left femur. The original is figured by Van Beneden, *op. cit.* figs. 14, 15.

M. 1186 a. Cast of the proximal extremity of the right tibia. The original is figured by Van Beneden, *op. cit.* fig. 17.

[1] Bull. Ac. R. Belg. ser. 2, vol. viii. p. 142 (1859). [2] *Loc. cit.*

Genus **CALLOPHOCA,** Van Beneden[1].

Callophoca obscura, Van Beneden[2].

This species is allied to the existing *Phoca grœnlandica*.
Hab. Europe.

M. 1157. Cast of the humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xi. figs. 1–4.

M. 1158. Cast of the left radius. The original is figured by Van Beneden, *op. cit.* figs. 5, 6.

M. 1161. Cast of the left innominate (imperfect). The original is figured by Van Beneden, *op. cit.* fig. 7.

M. 1160. Cast of the left femur. The original is figured by Van Beneden, *op. cit.* figs. 8–10.

M. 1159. Cast of the left tibia. The original is figured by Van Beneden, *op. cit.* fig. 13.

M. 1162. Cast of the calcaneum. The original is figured by Van Beneden, *op. cit.* figs. 11, 12.

Genus **PLATYPHOCA,** Van Beneden[3].

Platyphoca vulgaris, Van Beneden[4].

This species is allied to the existing *Phoca barbata*.
Hab. Europe.

M. 1187. Cast of the left humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xii. figs. 1–4.

M. 1188. Cast of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 5.

M. 1189. Cast of the left femur. The original is figured by Van Beneden, *op. cit.* figs. 6–8.

M. 1190. Cast of the right tibia. The original is figured by Van Beneden, *op. cit.* fig. 9.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 799 (1876).
[2] *Loc. cit.* [3] *Loc. cit.* [4] *Loc. cit.*

Genus **GRYPHOCA,** Van Beneden [1].

Gryphoca similis, Van Beneden [2].

This species is allied to the existing *Halichœrus gryphus*.
Hab. Europe.

M. 1191. Cast of the left scapula. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xiii. figs. 1, 2.

M. 1192. Cast of the left humerus. The original is figured by Van Beneden, *op. cit.* figs. 3–6.

M. 1195. Cast of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 11.

M. 1196. Cast of the right femur. The original is figured by Van Beneden, *op. cit.* figs. 14–16.

M. 1197. Cast of the proximal extremity of the right tibia. The original is figured by Van Beneden, *op. cit.* figs. 19, 20.

M. 1198. Cast of the astragalus. The original is figured by Van Beneden, *op. cit.* fig. 21.

M. 1193. Cast of a lumbar vertebra. The original is figured by Van Beneden, *op. cit.*

M. 1194. Cast of the sacrum. The original is figured by Van Beneden, *op. cit.*

Genus **PHOCANELLA,** Van Beneden [3].

Phocanella pumila, Van Beneden [4].

This species is allied to the existing *Phoca fœtida*.
Hab. Europe.

M. 1199. Cast of the right humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xiv. figs. 1–4.

M. 1200. Cast of the distal half of the left radius. The original is figured by Van Beneden, *op. cit.* fig. 5.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 799 (1876).
[2] *Loc. cit.* [3] *Loc. cit.* [4] *Loc. cit.*

M. 1202. Cast of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 7.

M. 1203–4. Casts of two humeri. The originals are figured by Van Beneden, *op. cit.* figs. 8–10.

M. 1205. Cast of the proximal extremity of the right tibia and fibula. The original is figured by Van Beneden, *op. cit.* fig. 12.

M. 1201. Cast of a lumbar vertebra. The original is figured by Van Beneden, *op. cit.* fig. 6.

Phocanella minor, Van Beneden [1].

This species is allied to the existing *Phoca fœtida*.
Hab. Europe.

M. 1206. Cast of the right humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xiv. figs. 13–16.

M. 1209. Cast of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 20.

M. 1208. Cast of the right innominate. The original is figured by Van Beneden, *op. cit.* figs. 21–23.

M. 1210. Cast of the right tibia and fibula. The original is figured by Van Beneden, *op. cit.* fig. 24.

M. 1207. Cast of the sacrum. The original is figured by Van Beneden, *op. cit.* fig. 18.

Genus **PHOCA,** Linn.[2]

Phoca vitulinoides, Van Beneden [3].

This species is allied to the existing *Phoca vitulina*.
Hab. Europe.

M. 1211. Cast of a portion of the scapula. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xv. fig. 5.

M. 1212. Cast of the left humerus. The original is figured by Van Beneden, *op. cit.* figs. 6–10.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 799 (1876).
[2] Syst. Nat. ed. 12, vol. i. p. 55 (1766).
[3] Bull. Ac. R. Belg. ser. 2, vol. xxxii. p. 5 (1871).

M. 1217–8. Casts of parts of the radius and ulna. The originals are figured by Van Beneden, *op. cit.* figs. 10, 11.

M. 1215. Cast of the innominate. The original is figured by Van Beneden, *op. cit.* fig. 28.

M. 1216. Cast of the right femur. The original is figured by Van Beneden, *op. cit.* figs. 19–21.

M. 1219. Cast of the left tibia. The original is figured by Van Beneden, *op. cit.* fig. 22.

M. 1213. Cast of the distal portion of the tibia and fibula. The original is figured by Van Beneden, *op. cit.* fig. 25.

M. 1214. Cast of the associated femur, innominates, sacrum, and three vertebræ. The originals are figured by Van Beneden, *op. cit.*

Genus **MONATHERIUM,** Van Beneden [1].

The genus is considered to be closely allied to the existing *Monachus*.

Monatherium delogni, Van Beneden [2].

Hab. Europe.

M. 1220. Cast of the sacrum and innominate. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xvi. figs. 5, 6.

M. 1221. Cast of the centrum of a dorsal vertebra. The original is figured by Van Beneden, *op. cit.* fig. 1.

M. 1222. Cast of the centrum of a lumbar vertebra. The original is figured by Van Beneden, *op. cit.* fig. 2.

M. 1223. Cast of the centrum of a caudal vertebra. The original is figured by Van Beneden, *op. cit.* fig. 3.

Monatherium affine, Van Beneden [3].

Hab. Europe.

M. 1224. Cast of the right humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xvi. figs. 7–9.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 800 (1876).
[2] *Loc. cit.* [3] *Loc. cit.*

M. 1225. Cast of the proximal extremity of the ulna. The original is figured by Van Beneden, *op. cit.* fig. 10.

M. 1226. Cast of the right radius. The original is figured by Van Beneden, *op. cit.* fig. 11.

M. 1228. Cast of the astragalus. The original is figured by Van Beneden, *op. cit.* fig. 12.

M. 1229. Cast of the calcaneum. The original is figured by Van Beneden, *op. cit.* fig. 13.

M. 1227. Cast of the tibia. The original is figured by Van Beneden, *op. cit.* fig. 14.

Monatherium aberratum, Van Beneden[1].

Hab. Europe.

M. 1230. Cast of the right humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i pl. xvii. figs. 1–4.

M. 1238. Cast of the radius. The original is figured by Van Beneden, *op. cit.* fig. 5.

M. 1233. Cast of the astragalus. The original is figured by Van Beneden, *op. cit.* fig. 14.

M. 1235. Cast of the fifth left metatarsal. The original is figured by Van Beneden, *op. cit.* fig. 11.

M. 1235 a. Cast of the fifth left phalangeal. The original is figured by Van Beneden, *op. cit.* fig. 10.

M. 1236. Cast of a portion of the sternum. The original is figured by Van Beneden, *op. cit.* fig. 6.

M. 1232. Cast of the centrum of a cervical vertebra. The original is figured by Van Beneden, *op. cit.* fig. 9.

M. 1231. Cast of the centrum of the fifth dorsal vertebra. The original is figured by Van Beneden, *op. cit.* figs. 7, 8.

M. 1236–7. Casts of numerous associated bones. The originals are figured by Van Beneden, *op. cit.*

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 800 (1876).

Genus **PROPHOCA,** Van Beneden[1].

Although this genus is a true Phocid, its affinities with any one of the existing types rather than with another are not apparent (*Allen*).

Prophoca rousseaui, Van Beneden[2].

Hab. Europe.

M. 1239. Cast of the right humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xviii. fig. 1.

M. 1241. Cast of the left radius. The original is figured by Van Beneden, *op. cit.* fig. 3.

M. 1242. Cast of the right femur. The original is figured by Van Beneden, *op. cit.* fig. 8.

M. 1243. Cast of the left tibia. The original is figured by Van Beneden, *op. cit.* fig. 8.

M. 1240. Casts of three associated lumbar vertebræ, the sacrum, and pelvis. The originals are figured by Van Beneden, *op. cit.*

Prophoca proxima, Van Beneden[3].

Hab. Europe.

M. 1244. Cast of the left humerus. The original is figured by Van Beneden in the Ann. Mus. R. Hist. Nat. Belg. vol. i. pl. xviii. figs. 12–14.

M. 1246. Cast of the left radius. The original is figured by Van Beneden, *op. cit.* fig. 15.

M. 1245. Cast of the left ulna. The original is figured by Van Beneden, *op. cit.* fig. 16.

[1] Bull. Ac. R. Belg. ser. 2, vol. xli. p. 802 (1876).
[2] *Loc. cit.* [3] *Loc. cit.*

Order RODENTIA.

Suborder *RODENTIA SIMPLICIDENTATA.*

There is but one pair of incisors developed in the upper jaw.

Section SCIUROMORPHA.

Family SCIURIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{(1-2)}{1}$, M. $\frac{3}{3}$.

Genus **SCIURUS,** Linn.[1]

(Including *Palæosciurus*, Pomel[2].)

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Sciurus vulgaris, Linn.[3]

Hab. Europe and Northern Asia.

17644. (*Fig.*) The right humerus; from the Forest-bed of Ostend, Norfolk. This specimen is figured by E. T. Newton in the Geol. Mag. dec. 2, vol. viii. p. 259 (1881), and in the Mem. Geol. Surv. Eng. "Vertebrata of Forest-bed Series," p. 92, pl. xiv. fig. 12 (1882). *Green Collection. Purchased*, 1843.

Sciurus feignouxi, Pomel[4].

Syn. *Palæosciurus feignouxi*, Pomel[5].
Spermophilus speciosus, H. v. Meyer[6] (*teste* Schlosser).

Hab. Europe.

26713. The greater portion of the right ramus of the mandible, showing all the cheek-teeth except the first true molar; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen is precisely similar to a mandible figured by Filhol in the Ann. Sci. Géol. vol. x. pl. iv. figs. 14, 15. *Pomel Collection. Purchased*, 1851.

[1] Syst. Nat. ed. 12, vol. i. p. 86 (1766).
[2] Catalogue Méthodique, p. 17 (1853).
[3] Syst. Nat. ed. 12, vol. i. p. 86 (1766).
In P. Gervais, Zool. et Pal. Françaises, 1st ed., explanation of pl. xlvii. p. 7 (1848–52).
[5] Catalogue Méthodique, p. 17 (1853).
[6] Neues Jahrb. 1859, p. 474.

26714. The right femur; from the Lower Miocene of St. Gérand-le-Puy. A similar specimen is figured by Filhol, *op. cit.* figs. 7, 8. *Pomel Collection. Purchased*, 1851.

31086. Fragment of the right ramus of the mandible[1], containing $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31087. An upper incisor; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31088. A lower incisor; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

31090 a. Distal half of the humerus; from the Lower Miocene of Allier. A similar specimen is figured by Filhol, *op. cit.* figs. 1, 2. *Bravard Collection. Purchased*, 1852.

31089–92. Four specimens of the tibia (two imperfect); from the Lower Miocene of Allier. A similar specimen is figured by Filhol, *op. cit.* figs. 19, 20. *Bravard Collection. Purchased*, 1852.

31093. The left calcaneum; from the Lower Miocene of Allier. A similar specimen is figured by Filhol, *op. cit.* figs. 4, 5. *Bravard Collection. Purchased*, 1852.

Sciurus chalaniati, Pomel[2].

This is a very minute species, which Filhol thinks does not approximate to any existing form. It has hitherto been recorded only from the Lower Miocene of St. Gérand-le-Puy; but the writer has been unable to distinguish the Upper Eocene specimens noticed below from the type form. Schlosser[3] refers a mandible from the phosphorites to a new species, under the name of *S. dubius*; that mandible is slightly larger than the type of *S. chalaniati*, but the points in which it differs are not distinctly defined.

Hab. France.

M. 1630. Three specimens of rami of the mandible, with the dentition imperfect; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. These specimens apparently agree

[1] This and the other specimens from the Bravard Collection are entered in the Museum Register as *Amphisciurus typus*, Bravard, MS.

[2] Catalogue Méthodique, p. 17 (1853).

[3] Palæontographica, vol. xxxi. p. 70 (1884).

precisely with the mandible of *S. chalaniati* figured by Filhol in the Ann. Sci. Géol. vol. x. pl. xii. fig. 31.
Purchased, 1884.

Sciurus, sp. (cf. *S. bredai*, H. v. Meyer[1]).

Hab. Europe.

42826. The much-crushed skeleton of a rodent, probably belonging to the present genus, from the Upper Miocene of Œningen, Switzerland. It is not improbable that this specimen, which indicates an animal rather smaller than *S. vulgaris*, may belong to Meyer's ill-defined *S. bredai*, which Schlosser[2] suggests may be identical with one of the Sansan species. *Van Breda Collection. Purchased*, 1871.

Genus **PSEUDOSCIURUS,** Hensel[3].

Dentition.—The cheek-teeth of this genus are distinguished from those of *Sciurus* by their more elongated crowns. The number of the teeth is the same as in *Sciurus*.

Pseudosciurus suevicus, Hensel[4].

Hab. Switzerland.

35820. Fragments of the mandible and incisors; from the Upper Eocene ("Bohnerz") of Œrlinger-Thal, Würtemberg.
Purchased, 1860.

35821–2. Two incisors; from the Upper Eocene of Œrlinger-Thal.
Purchased 1860.

35823. Three vertebræ; from the Upper Eocene of Œrlinger-Thal.
Purchased, 1860.

35824. Fragments of various limb-bones; from the Upper Eocene of Œrlinger-Thal. *Purchased* 1860.

Genus **SCIUROIDES,** Forsyth-Major[5].

The cheek-teeth of this genus are also of an elongated form. The number of the teeth is the same as in *Sciurus*.

[1] Neues Jahrb. 1848, p. 472.
[2] Palæontographica, vol. xxxi. p. 70 (1884).
[3] Zeitschr. deutsch. geol. Ges. vol. viii. p. 660 (1856). [4] *Ibid.* p. 670.
[5] Palæontographica, vol. xxii. p. 83 (1878).

Sciuroides quercyi, Schlosser[1].

Hab. France.

M. 1349. Three rami of the mandible; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. The perfect specimen agrees precisely with the one figured by Schlosser, *loc. cit.* pl. i. figs. 3, 8. The space occupied by the four cheek-teeth measures 0,016. *Purchased*, 1884.

Sciuroides intermedius, Schlosser[2].

This species is smaller than the last.

Hab. France.

M. 1348 c. Fragment of the left maxilla, containing the first three cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the one figured by Schlosser, *loc. cit.* pl. i. figs. 9, 13. *Purchased*, 1884.

Genus **SPERMOPHILUS,** F. Cuvier[3].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{2}{1}$, M. $\frac{3}{3}$.

Spermophilus superciliosus, Kaup[4].

Syn. *Arctomys superciliosus*, Pictet.

Hab. Europe.

21500. The cranium and mandible (imperfect); from the Pleistocene of Eppelsheim, Hesse-Darmstadt. *Purchased*, 1847.

26720–4. Two rami of the mandible and numerous limb-bones; from the Pleistocene of Coredes (Puy-de-Dôme), France. *Pomel Collection. Purchased*, 1851.

Spermophilus erythrogenoides, Falconer[5].

Hab. Europe.

47500. Anterior portion of the cranium, three portions of the mandible, numerous limb-bones, and five vertebræ of a species of Souslik; from the Pleistocene of Erith, Kent.

[1] Palæontographica, vol. xxxi. p. 60 (1884). [2] *Ibid.* p. 62.
[3] Mem. d. Muséum, vol. ix. p. 293 (1822), *Spermophile.*
[4] In Meyer's 'Palæologia,' p. 58 (1832).
[5] In 'Falconer's Palæontological Memoirs,' vol. ii. p. 453 (1868).

The mandibles appear to be indistinguishable from Falconer's type mandible of *S. erythrogenoides*, figured in the 'Palæontological Memoirs,' vol. ii. pl. xxxv. figs. 1, 2, 3; the space occupied by the three true molars being precisely the same in both (0,010). Nehring[1] considers *S. erythrogenoides* very close to *S. eversmanni*, Brandt (*S. altaicus*, Eversmann). The molars of the Erith cranium seem indeed indistinguishable from some upper teeth from the Forest-bed, figured by E. T. Newton in the Geol. Mag. dec. 2, vol. ix. pl. ii. (1882), and provisionally referred to that species; but the three lower molars of the Forest-bed form measure only 0,085; and the recent mandible of *S. eversmanni* figured by Falconer (*loc. cit.* figs. 6, 7) is decidedly smaller than the Erith specimens, and relatively lower at $\overline{\text{pm. 4}}$. On the whole, apart from the question as to the specific distinctness of *S. erythrogenoides*, it appears highly probable that the Erith Souslik belongs to that form. *Presented by R. W. Cheadle, Esq.*, 1876.

Genus **PLESIARCTOMYS**, Bravard[2].

The molars of this genus approach those of the Squirrels.

Plesiarctomys gervaisi, Bravard[3].

Syn. *Sciurus arctomynus*, Pomel[4].

Hab. France.

27584. (*Fig.*) Part of the left ramus of the mandible, showing the four cheek-teeth; from the Upper Eocene of Apt (Vaucluse), France. This specimen, which is the type, is figured and described by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pp. 24, 25, pl. xlvi. fig. 13.

Bravard Collection. Purchased, 1852.

Genus **ARCTOMYS**, Schreber[5].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{2}{1}$, M. $\frac{3}{3}$.

[1] Neues Jahrb. 1880, vol. ii. p. 121.

[2] In P. Gervais's Zool. et Pal. Françaises, 1st ed., explanation of pl. xlvi. p. 2 (1848–52).

[3] *Ibid.*

[4] Catalogue Méthodique, p. 18 (1853).

[5] Säugethiere, vol. iv. p. 721 (1792).

Arctomys marmotta (Linn.[1]).

Syn. *Mus marmotta*, Linn.[2]
Arctomys primigenius, Kaup [3].
Myoxus primigenius, Kaup.

Hab. Europe.

There appear to be no sufficient grounds for separating *Arctomys primigenius* from the slightly smaller existing European form.

27624 a. The cranium and two portions of the mandible; from the Pleistocene of Champeix, near Issoire (Puy-de-Dôme), France. *Croizet Collection. Purchased*, 1848.

Family CASTORIDÆ.

Dentition :—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **CASTOR**, Linn.[4]

Castor fiber, Linn.[5]

Syn. *Castor fossilis*, Goldfuss [6].
Castor europæus, Owen [7].

Hab. Europe.

39889. A nearly complete skeleton; from Watcham Fen, near Ely, Cambridgeshire. *Purchased*, 1866.

39889 a. The cranium and mandible; from Isleham Fen, near Cambridge. *Presented by — Barrett, Esq.*

41368. The cranium and mandible; from the turbary of the Lea valley, near Walthamstow, Essex. *Purchased*, 1869.

42922. The cranium, wanting the zygomatic arches, the incisors, and some of the cheek-teeth; from the turbary of Ghent, Belgium. *Van Breda Collection. Purchased*, 1871.

46133. Cranium, wanting the malar bones; dredged off the Dogger Bank. *Owles Collection. Purchased*, 1874.

37199. Cranium, wanting the right zygomatic arch; from Ditton Fen, Cambridgeshire. *Purchased*, 1863.

[1] Syst. Nat. ed 12, vol. i. p. 81 (1766). [2] *Loc. cit.*
[3] In Meyer's 'Palæologia,' p. 61 (1832).
[4] Syst. Nat. ed. 12, vol. i. p. 78 (1766). [5] *Loc. cit.*
[6] Nova Acta Ac. Cæs. Leop.-Car. vol. xi. pt. 2, p. 488 (1823).
[7] 'British Fossil Mammals and Birds,' p. 190 (1846).

37200. The right ramus of the mandible, wanting the incisor; from Ditton Fen. *Purchased*, 1863.

39468. The anterior portion of the cranium and the mandible; from the Fens of Lincolnshire. *Purchased*, 1865.

42715. The mandible; from the Fens near Ely, Cambridgeshire. *Purchased*, 1871.

23767. The greater portion of the left ramus of the mandible; from the Pleistocene of Ilford, Essex. *Purchased*, 1849.

M. 1623. The greater portion of the right ramus of the mandible, wanting the greater part of the canine; from the Pleistocene of Ilford. *Brady Collection*. *Purchased*, 1878.

39900. The right ramus of the mandible of a young individual; from Burwell Fen, Cambridgeshire. *Purchased*, 1866.

22038. Two portions of incisors; from the Pleistocene of Grays, Essex. *Purchased*, 1848.

23768. Five cheek-teeth; from the Pleistocene of Ilford, Essex. *Purchased*, 1849.

41369. The two scapulæ, humeri, radius and ulna, tibia, and parts of the vertebral column; from the turbary of the Lea valley, near Walthamstow, Essex. *Purchased*, 1869.

41451. The left humerus, wanting the head; from the turbary of the Lea valley, near Walthamstow. *Purchased*, 1869.

41452. The left humerus, wanting the epiphyses; from the turbary of the Lea valley, near Walthamstow. *Purchased*, 1869.

36629–30. Two humeri (imperfect); from the Pleistocene of Grays, Essex. *Purchased*, 1855.

39468. The associated humerus, radius, ulna, femur, and tibia; from the Fens of Lincolnshire. *Purchased*, 1865.

39895. Two humeri, two femora, the tibia and fibula, innominate, and part of the vertebral column; from the Fens, near Cambridge. *Purchased*, 1866.

41750. The pelvis; from the turbary of the Lea valley, near Walthamstow. *Purchased*, 1869

41450. The right innominate; from the turbary of the Lea valley, near Walthamstow. *Purchased*, 1869.

39468 a. The scapula, the humerus, radius, and ulna of a young individual; from the Fens of Lincolnshire. *Purchased*, 1865.

Genus **TROGONTHERIUM**, Fischer[1].

Syn. *(?) Diobroticus*, Pomel[2].

History.—The genus *Trogontherium* was originally described by Fischer on the evidence of a cranium from the Pleistocene of Siberia. Remains of a large Rodent from the Pleistocene of England and France were subsequently referred by Owen[3] to the same genus and species. P. Gervais[4] came, however, to the conclusion that both the English and French specimens were generically distinct from Fischer's specimen, and adopted for them Pomel's name of *Diobroticus*. This view is followed by Alston[5] and Flower[6]; but E. T. Newton[7] comes to the conclusion that Owen's view is correct, alleging that the difference between Fischer's specimen and the English and French form is merely due to differences in the degree of wear of the cheek-teeth. As this view has not been disproved, it is provisionally adopted here.

Trogontherium cuvieri, Fischer[8].

Syn. (?) *Diobroticus schmerlingi*, Pomel[9].
Castor trogontherium, Cuvier[10].

Hab. Europe.

M. 472. Cast of the cranium, wanting the zygomatic arches and the nasals. The original, which is Fischer's type specimen, was obtained from the Pleistocene of Siberia, and is preserved in the Museum at Moscow.

Presented by the Moscow University.

[1] Mém. Soc. Imp. Nat. Mosc. vol. ii. p. 260 (1809).
[2] Arch. Sci. Phys. Nat. vol. ix. p. 167 (1848).
[3] Catalogue Foss. Rem. of Mammalia and Aves in Mus. Roy. Coll. Surgeons, p. 35 (1845); British Foss. Mammals and Birds, p. 184 (1846); Geol. Mag. vol. vi. p. 49 (1869).
[4] Zool. et Pal. Générales, 1st ser. p. 81 (1867–69).
[5] Proc. Zool. Soc. 1876, p. 78.
[6] Catalogue of Mammalia in Mus. Roy. Coll. Surg. p. 602 (1884).
[7] Geol. Mag. dec. 2, vol. viii. p. 256 (1881).
[8] *Loc. cit.* [9] *Loc. cit.*
[10] Ossemens Fossiles, 1st ed. vol. v. pt. 1, p. 59 (1823). The specific name *trogontherium* has the priority over *cuvieri*; but the former has been so generally used in a generic sense that it seems best to retain the latter.

16449. (*Fig.*) The right ramus of the mandible; from the Forest-bed of Bacton, Norfolk. This specimen (which may be regarded as the type of Pomel's *Diobroticus schmerlingi*) is figured by Owen in the 'British Fossil Mammals and Birds,' fig. 71, p. 184. *Green Collection. Purchased*, 1843.

40978. (*Fig.*) Part of the left ramus of the mandible, containing the premolar and the first and second true molars; from the Forest-bed of Cromer, Norfolk. This specimen is figured by Owen, *op. cit.* figs. 72–3, pp. 186, 189.
Presented by Sir C. Lyell, Bart., 1868.

16119. Greater portion of an incisor; from the Forest-bed of Bacton.
Green Collection. Purchased, 1843.

M. 1570. Casts of an incisor and parts of the mandible. The originals are from the Forest-bed of Mundesley, Norfolk.
No history.

40979. Distal extremity of the femur; from the Norwich Crag of Thorpe, Norfolk. This specimen is the one mentioned by Owen in the 'British Fossil Mammals and Birds,' p. 191, where it is referred to *Castor fiber* (*europæus*).
Presented by Sir C. Lyell, Bart., 1868.

40979 a. Casts of the femur, tibia, and calcaneum. The originals are from the Forest-bed of Mundesley, Norfolk, and are figured by Owen in the Geol. Mag. vol. vi. pl. iii. (1869). The originals were in the collection of the Rev. S. W. King.
No history.

Genus **CHALICOMYS**, Kaup[1].

Syn. *Steneofiber*, Geoffroy[2].
Steneotherium, Geoffroy[3].
Chloromys, H. v. Meyer[4].

The writer follows Schlosser, "Die Nager des europäischen Tertiärs" 'Palæontographica, vol. xxxi., p. 21 (1884), in uniting *Chalicomys* and *Steneofiber*. The former name, having the priority, is adopted for the genus. The genus is distinguished from *Castor* by the presence of an entepicondylar foramen to the humerus. The molars are more distinctly rooted and have squarer crowns, with

[1] Isis, 1832, p. 994.
[2] Revue Encyclopédique, vol. lix. p. 95 (1833).
[3] *Loc. cit.*
[4] Neues Jahrb. 1843, p. 390.

the enamel-folds obliterated at an earlier stage of wear. The cranium presents well-marked differences from *Castor*.

Chalicomys eseri, H. v. Meyer[1].

Syn. *Chloromys*, H. v. Meyer[2].
Steneofiber eseri, Pomel[3].
Steneofiber viciacensis, P. Gervais[4].
Steneofiber nouleti, Pomel[5] (*in parte*?).
Steneofiber castorinus, Pomel[6].

The authority for most of the synonymy is that of Filhol, in the Ann. Sci. Géol. vol. x. art. 3, p. 44 (1879). The species is a difficult one to define, as there seems a great amount of variation in the size of the teeth of different specimens, which appear, however, to pass so gradually into one another as to forbid their specific separation.

Hab. Europe.

26707. Anterior portion of the right ramus of the mandible, containing the canine and the first three cheek-teeth; from the Lower Miocene of St. Gérand-le-Puy (Allier), France. This specimen agrees very well in relative size with the cranium figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlviii. fig. 9 *a*, and is of very nearly the same size as the mandible figured by Filhol in the Ann. Sci. Géol. vol. x. pl. v. fig. 3; the length of the space occupied by the first three cheek-teeth is, however, somewhat less. *Pomel Collection. Purchased*, 1851.

26708. Articular portion of the left ramus of the mandible; from the Lower Miocene of St. Gérand-le-Puy.
Pomel Collection. Purchased, 1851.

40897. The greater part of the left ramus of the mandible, showing all the teeth; from the Lower Miocene of Allier. The premolar is smaller than in No. 26707, but the true molars are of the same size. *Presented by C. Falconer, Esq.*, 1867.

[1] Neues Jahrb. 1846, p. 474. (The species is often quoted as Neues Jahrb. 1838, p. 414; 1843, p. 390; but these are incorrect: the names *eseri* and *castorinus* were applied in the same year.)
[2] *Ibid.* 1843, p. 390.
[3] Catalogue Méthodique, p. 21 (1853); *errorim, eschari.*
[4] Zool. et Pal. Françaises, 1st ed. vol. i. p. 22 (1848–52).
[5] Catalogue Méthodique, p. 24 (1853).
[6] Bull. Soc. Géol. France, ser. 2, vol. iv. p. 385 (1846).

35747. Fragments of the mandible, showing the cheek-teeth of both sides; from the Lower Miocene of Germany. The premolar is of the same size as that of No. 26707, but the true molars are larger, and are also slightly larger than those in the specimen figured by Filhol, *loc. cit.* The length of the space occupied by the first three cheek-teeth in this specimen is 0,0165, and in No. 26707, 0,0155.
Purchased, 1865.

35748. Part of an incisor; from the Lower Miocene of Harlach, near Ulm, Würtemberg. *Purchased*, 1865.

31064. Part of the left ramus of the mandible, with the four cheek-teeth; from the Lower Miocene of St. Gérand-le-Puy. The teeth are slightly smaller than those of No. 40897, the length of the first three being 0,0135. The difference in the size of this specimen and No. 35747 is very considerable, but the other specimens afford such a transition, that it appears impossible to separate them.
Bravard Collection. Purchased, 1852.

31063. Part of the right ramus of the mandible, agreeing in size with the last; from the Lower Miocene of St. Gérand-le-Puy. *Bravard Collection. Purchased*, 1852.

31062. Part of the left ramus of the mandible of an immature individual, containing the milk-molar and the three true molars; from the Lower Miocene of St. Gérand-le-Puy. This specimen agrees in size with the two last.
Bravard Collection. Purchased, 1852.

40901. The right humerus, wanting the head; from the Lower Miocene of Allier. This specimen is similar to one figured by Filhol in the Ann. Sci. Géol. vol. x. pl. vi. figs. 8, 9.
Presented by C. Falconer, Esq., 1867.

26709. The left humerus; from the Lower Miocene of St. Gérand-le-Puy. *Bravard Collection. Purchased*, 1852.

26710. The left innominate; from the Lower Miocene of St. Gérand-le-Puy. This specimen agrees precisely with a less perfect one figured by Filhol, *op. cit.* fig. 10.
Bravard Collection. Purchased, 1852.

26711, 31067, 31072. Three specimens of the femur; from the

Lower Miocene of St. Gérand-le-Puy. No. 31072 agrees precisely with a specimen figured by Filhol, *op. cit.* figs. 13, 14. *Bravard Collection. Purchased*, 1852.

26712, 31070–1. Three specimens of the tibia; from the Lower Miocene of St. Gérand-le-Puy. No. 26712 agrees precisely with a specimen figured by Filhol, *op. cit.* figs. 11, 12. *Bravard Collection. Purchased*, 1852.

27756 b. Part of an incisor; from the Lower Miocene of Puy-de-Dôme. *Croizet Collection. Purchased*, 1848.

Chalicomys jægeri, Kaup[1].

Syn. *Castor jægeri*, Kaup[2].
Castor subpyrenaicus, Lartet[3].
Steneofiber jægeri, Schlosser[4].

Hab. Europe.

48474. Fragments of the upper and lower jaws; from the Middle Miocene of Käpnach, Switzerland.
Presented by C. Falconer, Esq., 1867.

21500 a. Cast of a part of the right ramus of the mandible; the original from the Miocene near Mayence. *Purchased.*

33263. The third right lower true molar; from the Middle Miocene of Sansan (Gers), France. This specimen belongs to Lartet's *Castor subpyrenaicus*, which Schlosser identifies with the present species. *Presented by M. Ed. Lartet,*

Genus **CASTOROIDES**, Foster[5].

In this genus, which is of gigantic size, the incisors have numerous longitudinal grooves, and the cheek-teeth have their enamel-folds completely separate and extending quite across their crowns; there are four folds in the last upper true molar and the lower premolar, but only three in all the other teeth.

[1] Isis, 1832, p. 995.
[2] Oss. Foss. d. Darmstadt, pt. 5, p. 115 (1839).
[3] Notice sur la Colline Sansan, p. 21 (1851).
[4] Palæontographica, vol. xxxi. p. 23 (1884).
[5] In Mather's Second Annual Report of the Geological Survey of the State of Ohio, p. 81 (Columbus, 1838).

Castoroides ohioensis, Foster[1].

Hab. N. America.

40341. Cast of the cranium and the right ramus of the mandible. The original is from the Pleistocene of Clyde, New York, and is preserved in the Geneva College, New York.

Purchased, 1869.

GENUS *non det.*

Hab. England.

27985. (*Fig.*) A lower cheek-tooth of a large Rodent; from the Pleistocene of Copford, Essex. This specimen is figured in the Quart. Journ. Geol. Soc. vol. viii. p. 188 (1852), and is there provisionally referred to *Castor*. The figure is reproduced in the accompanying woodcut (fig. 30). The

Fig. 30.

Lower cheek-tooth of a castoroid rodent; from the Pleistocene of Copford. ½. (From the Geological Society's 'Journal.')

tooth differs from the molars of all species of *Castor* known to the writer, by the circumstance that the enamel-folds run directly across the crown. It comes nearer to the molars of *Trogontherium*, but does not seem to agree exactly with any specimens available for comparison.

Presented by John Brown, Esq., 1852.

[1] In Mather's Second Annual Report of the Geological Survey of the State of Ohio, p. 81 (Columbus, 1838).

Section MYOMORPHA.

Family MYOXIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **MYOXUS**, Schreber[1].

For palæontological purposes it seems that this genus must be taken to include *Muscardinus*, *Eliomys*, and *Graphiurus*, as many of their distinctive characters are not applicable to fossils. *Myoxus* proper and *Muscardinus* have well-marked and numerous enamel-folds on the flat crowns of the cheek-teeth, and no perforation in the angle of the mandible. In *Eliomys* the mandible is perforated, and the crowns of the cheek-teeth are concave and have few and faintly-marked enamel-folds. In *Graphiurus* the mandible is imperforate, and the crowns of the cheek-teeth are flat, with scarcely any traces of enamel-folds.

Myoxus melitensis, Leith Adams[2].

Syn. *Myoxus cartei*, Leith Adams[3].

This is the largest species of the genus. The cheek-teeth have flat crowns with complex foldings, and there is no perforation in the angle of the mandible. The species consequently belongs to *Myoxus* proper.

Hab. Malta.

49342. The nearly complete cranium, wanting the incisors, but showing the whole of the cheek-teeth, in a well-worn condition; from the Crendi Cave, Malta. The length from the inferior border of the foramen magnum to the extremity of the premaxilla is 0,060, and the length of the space occupied by the four cheek-teeth 0,013.

Spratt Collection. Presented, 1878.

49343. Anterior portion of the cranium, wanting several of the cheek-teeth; from the Crendi Cave.

Spratt Collection. Presented, 1878.

49344. Anterior portion of the cranium, wanting the nasals, and

[1] Säugethiere, vol. iv. p. 824 (1792).

[2] Journ. R. Dublin Soc. vol. iv. p. 18 (1863) (read Nov. 1861). The name is misprinted *miletensis*.

[3] *Loc. cit.* pl. ii.

with the teeth in an unworn condition; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

49345. Anterior portion of the cranium, somewhat damaged, but with the teeth in an unworn condition; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

49346. Anterior portion of the cranium, with the teeth in a slightly worn condition; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

49347. The anterior portion of the cranium, with the crowns of the teeth hammered off; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

49348. The palatal portion of the cranium, wanting the cheek-teeth of the left side; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

49349. The occipital portion of a very large cranium; from the Crendi Cave. *Spratt Collection.* *Presented*, 1878.

44574. Numerous specimens of the upper and lower dentition; from the caves of Malta. *Leith-Adams Collection.* *Purchased*, 1873.

49350. Numerous specimens of the mandible; from the Crendi Cave. The space occupied by the four cheek-teeth in the largest individual is 0,016, and the width of the penultimate molar 0,005. *Spratt Collection.* *Presented*, 1878.

49342 a. Five specimens of the mandible; from the Zebbug Cave, Malta. *Spratt Collection.* *Presented*, 1878.

44574 a. (*Fig.*) Glenoidal extremity of the scapula, one complete and five broken specimens of the humerus, and two specimens of the proximal extremity of the ulna; from the caves of Malta. The portion of the scapula and the humerus are figured by Leith Adams in the Trans. Zool. Soc. vol. vi. pl. liv. figs. 10–13. *Leith-Adams Collection.* *Purchased*, 1873.

44574 b. (*Fig.*) Four imperfect specimens of the innominate, one perfect and three imperfect specimens of the femur, and three imperfect specimens of the tibia; from the caves of Malta. The perfect femur is figured by Leith Adams in the Trans. Zool. Soc. vol. vi. pl. liv. figs. 8, 9. *Leith-Adams Collection.* *Purchased*, 1873.

49342 b. Five specimens of the femur (two imperfect); from the Zebbug Cave. *Spratt Collection. Presented*, 1878.

49351. Five imperfect specimens of the tibia and five of the calcaneum; from the Crendi Cave.
Spratt Collection. Presented, 1878.

44574 c. Several vertebræ and ribs; from the caves of Malta.
Leith-Adams Collection. Purchased, 1873.

49351. Several vertebræ and ribs; from the Crendi Cave.
Spratt Collection. Presented, 1878.

Myoxus sansaniensis, Lartet[1].

This is a minute species, distinguished by the complex arrangement of the enamel-folds of the lower molars; the mandible is imperforate.

Hab. France.

33274. Fragments of the mandible and maxillæ (with teeth), and of the humerus, femur, and tibia, with several complete specimens of the calcaneum; from the Middle Miocene of Sansan (Gers), France. These specimens agree precisely with those figured by Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xliv. *Presented by M. Ed. Lartet.*

Myoxus murinus, Pomel[2].

Syn. *Brachymus ornatus*, H. von Meyer [3].
Myoxus obtusangulus, H. von Meyer [4].
(?) *Myoxus primævus*, Schlosser [5].

This species has not hitherto been recorded below the Lower-Miocene horizon of St. Gérand-le-Puy. Schlosser has separated a mandible from the French phosphorites under the name of *M. primævus*, that specimen being slightly larger than the typical form, but apparently not distinguished by other characters. The folds on the crowns of the cheek-teeth are comparatively simple, and the angle of the mandible is perforated; whence it is not improbable that the species belongs to the so-called genus *Ellobius*.

Hab. France.

M. 1629. The greater part of the right ramus of the mandible; from the Upper Eocene of Caylux (Tarn-et-Garonne), France.

[1] Notice sur la Colline de Sansan, p. 20 (1851).
[2] Catalogue Méthodique, p. 24 (1853).
[3] Neues Jahrb. 1847, p. 454.
[4] *Ibid.* 1859, p. 172.
[5] Palæontographica, vol. xxxi. p. 76 (1884).

This specimen appears to agree precisely with the specimens figured by Filhol in the Ann. Sci. Géol. vol. x. pl. ii. figs. 3–6. The space occupied by the four cheek-teeth measures 0,004, or the same as in one of Filhol's specimens. The corresponding space in the mandible described by Schlosser as *M. primævus* measures 0,0046.

Purchased, 1884.

34904. The greater portion of the left ramus of the mandible, containing the incisor and the four cheek-teeth; from the Lower Miocene of Puy-de-Dôme[1]. The space occupied by the four cheek-teeth is 0,0036.

Bravard Collection. Purchased, 1852.

31118. The right ramus of the mandible, showing the incisor and the first true molar; from the Lower Miocene of Allier[2]. This specimen shows the perforation of the mandible, which is broken posteriorly.

Bravard Collection. Purchased, 1852.

31189. The femur, apparently associated with the last specimen.

Bravard Collection. Purchased, 1852.

Myoxus, sp.

This species is smaller than *M. melitensis*, and is also distinguished by the perforation of the mandible, in which respect it agrees with the group *Ellobius*. The specimens are too imperfect for specific determination.

Hab. Europe.

49342 c. The right ramus of the mandible, wanting the cheek-teeth; from the Crendi Cave, Malta.

Spratt Collection. Presented, 1878.

49351. The left ramus of the mandible, wanting the cheek-teeth; from the Crendi Cave, Malta.

Spratt Collection. Presented, 1878.

Family MURIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{0}{0}$, M. $\frac{3}{3}$ (except in *Sminthus* [Pm. $\frac{1}{0}$] and *Hydromys* [M. $\frac{2}{2}$]).

[1] Entered in Register as *Cænomys typus*, Brav. MS.

[2] Entered in Register as *Mus antiquus*, Brav. MS.

A. *Molars rooted.*

Genus **NESOKIA,** Gray[1].

Characterized mainly by the stoutness of the incisors; the first molars have three, and the others two ridges.

Nesokia, sp. (cf. *N. hardwicki*, Gray[2]).

Hab. India.

16529 a. Fragment of the left ramus of the mandible, containing the incisor, first molar, and the broken bases of the two succeeding teeth; from the Pliocene of the Siwalik Hills, India. This specimen is noticed by the present writer in the 'Palæontologia Indica,' ser. 10, vol. iii. p. 126, under the name of *Mus* (?) sp.; and is probably the source of the statement by Falconer and Cautley, in the Journ. As. Soc. Bengal, vol. iv. p. 706 (1835), that the genus occurs in the Siwaliks. It is practically undistinguishable from the corresponding part of the mandible of the existing *Nesokia hardwicki*, Gray; but, in view of the doubts as to the number of existing species, it would be unwise to say that it belongs to the same species, although it is quite possible that this may be the case. The Rodents of the Siwaliks are precisely the forms of mammals which might be expected to have continued unaltered to the present day.

Cautley Collection. Presented, 1842.

Genus **CRICETUS,** Cuvier[3].

Molars with tubercles arranged in pairs, of which the first has three and the rest two only; these entirely disappear in aged specimens (*Alston*).

Cricetus musculus, Pomel[4].

A minute species.

Hab. Europe.

26727–9. Two rami of the mandible, and two specimens of the humerus and femur; from the Pleistocene of Coudes (Puy-de-Dôme), France. The humerus shows the entepicondylar foramen characteristic of the genus.

Pomel Collection. Purchased, 1851.

Genus **MUS,** Linn.[5]

Molars with transverse ridges, each composed in youth of three tubercles (*Alston*).

[1] Ann. Mag. Nat. Hist. vol. x. p. 264 (1842).
[2] *Ibid.* vol. i. p. 585 (1837), *Mus.*
[3] Règne Animal, ed. 1, vol. i. p. 198 (1817).
[4] Cat. Méth. p. 31 (1853). [5] Syst. Nat. ed. 12, vol. i. p. 79 (1766).

Mus lineolatus, Gould[1].

Hab. Australia. The modern race of this species is confined to Tasmania, while the Pleistocene race occurred on the mainland of Australia. A similar distribution occurs in the case of *Mastacomys* and *Hapalotis*, as well as in *Thylacinus*.

43895. Several fragments of the cranium and mandible; from the caves of the Wellington Valley, Australia.
Presented by the Trustees of the Australian Museum, 1867.

Mus (?) sp.

Hab. Switzerland.

42823. The greater part of the skeleton of a murine rodent, in a much-crushed condition; from the Upper Miocene of Œningen, Switzerland. The condition of this specimen seems to preclude its exact determination.
Van Breda Collection. Purchased, 1871.

42821. The skeleton of a murine rodent, in a much-crushed condition; from the Upper Miocene of Œningen. This specimen, in which only the impression of the bones remains in many places, indicates an animal of about the size of *M. musculus*, but is too damaged for specific determination. *Van Breda Collection. Purchased*, 1871.

Genus **MASTACOMYS,** Thomas[2].

Distinguished from *Mus* by the excessive width of the molars, as well as by certain differences in the pattern on their crowns.

Mastacomys fuscus, Thomas[3].

Hab. Australia.

42673. Fragments of the maxilla and mandible, and two specimens of the tibia; from the caves of the Wellington Valley, Australia.
Presented by the Trustees of the Australian Museum, 1867.

Genus **HAPALOTIS,** Lichtenstein[4].

The molars of this genus have the same structure as in *Mus*.

Hapalotis albipes, Lichtenstein[5].

43895. Two imperfect rami of the mandible, and three detached

[1] Proc. Zool. Soc. 1845, p. 77.
[2] Ann. Mag. Nat. Hist. ser. 5, vol. ix. p. 413 (1882).
[3] *Loc. cit.*
[4] Darst. neuer Säugeth. vol. iv. pl. xxix. (1829).
[5] *Loc. cit.*

first molars; from the caves of the Wellington Valley, Australia.
Presented by the Trustees of the Australian Museum, 1867.

Genus **CRICETODON**, Lartet[1].

The molars are not unlike those of *Cricetus*, but there are only two pairs of tubercles on the first tooth in each jaw. The molars are also very like those of *Hesperomys*; and it is not improbable that the fossil genus may have been the ancestral form of several of the allied existing genera.

Cricetodon minor, Lartet[2].

Syn. *Cricetodon pygmæus*, Fraas[3].

This is a very minute species.
Hab. Europe.

33270. Numerous molars; from the Middle Miocene of Sansan (Gers), France. As these teeth, as well as the specimens of the other two named species from the same locality, were determined by Lartet, the correctness of the specific reference may be assumed. *Presented by M. Ed. Lartet.*

Cricetodon medius, Lartet[4].

Syn. *Cricetodon minor*, Fraas[5] (*teste* Schlosser).

This species is rather smaller than *Mus rattus*, the length of the space occupied by the cheek-teeth being about 0,006.
Hab. Europe.

33269. Detached teeth and fragments of the maxilla and mandible; from the Middle Miocene of Sansan (Gers), France.
Presented by M. Ed. Lartet.

Cricetodon cadurcensis, Schlosser[6].

Hab. France.

M. 1632. A ramus of the mandible; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the one figured by Schlosser, *loc. cit.* pl. viii. figs. 22, 28. The length of the space occupied by the

[1] Notice sur la Colline de Sansan, p. 20 (1851).
[2] *Loc. cit.*
[3] Fauna von Steinheim, p. 14 (1870).
[4] Notice sur la Colline de Sansan, p. 20 (1851).
[5] Fauna von Steinheim, p. 13 (1870).
[6] Palæontographica, vol. xxxi. p. 90 (1884).

three molars is 0,0068, the dimensions of Schlosser's specimens ranging from 0,0067 to 0,0073. *Purchased*, 1884.

Cricetodon gergovianus (P. Gervais[1]).

Syn. *Mus gergovianus*, P. Gervais[2].

Hab. France.

27756. The greater portion of the left ramus of the mandible; from the Lower Miocene of Cournon (Puy-de-Dôme), France. The length of the space occupied by the three molars is 0,0058, the length in the type form being 0,006 according to Schlosser. It is almost impossible to distinguish the present specimen from the mandible of the Upper-Miocene *C. medius* (No. 33269); and it appears quite probable that the two may be specifically the same.
Croizet Collection. Purchased, 1848.

Cricetodon sansaniensis, Lartet[3].

This species is rather larger than the Hamster.
Hab. Europe.

33268. A molar tooth; from the Middle Miocene of Sansan (Gers), France. *Presented by M. Ed. Lartet.*

48190. Three fragments of the mandible; from the Middle Miocene of Steinheim, Bavaria. The length of the space occupied by the three molars is 0,0084. *Purchased*, 1877.

Genus **HESPEROMYS,** Waterhouse[4].

Molars narrow, with tubercles arranged in pairs, which soon wear away, leaving the crown flat with indenting folds. Cranium with or without marked supraorbital ridges.

Hesperomys, sp. 1.

Hab. S. America.

17616. Anterior portion of the cranium of a comparatively large species, wanting the incisors, but showing the cheek-teeth; from a cavern near Lette-Lagoas, Brazil. This specimen is allied to the existing *H. angouya*, Desm., but is distinct. *Claussen Collection. Purchased*, 1845.

[1] Zool. et Pal. Françaises, 1st ed. vol. ii. explan. pl. xlviii. (1848–52), *Mus.*
[2] *Loc. cit.*
[3] Notice sur la Colline de Sansan, p. 20 (1851).
[4] Zoology of the Voyage of the 'Beagle,' vol. i. p. 75 (1839).

Hesperomys, sp. 2.

Hab. S. America.

17616 a. Anterior portion of the cranium, and two rami of the mandible; from the caverns of Minas Geraes, Brazil. This cranium is smaller than the last, and has not been identified with that of any living species.

Claussen Collection. Purchased, 1845.

Hesperomys, sp. 3.

Hab. S. America.

18898. Middle portion of the cranium, showing the cheek-teeth; from a cavern in Minas Geraes, Brazil. The teeth of this species are larger than those of the last. It comes nearest to the group *Oxymycteris.*

Claussen Collection. Purchased, 1845.

Hesperomys, sp. 4.

Hab. S. America.

18897. Anterior portion of the cranium, showing all the dentition; from a cavern in Minas Geraes, Brazil. This specimen belongs to the group *Habrothrix,* and comes nearest to the existing *H. arviculoides,* Pictet.

Claussen Collection. Purchased, 1845.

B. *Molars semirooted or rootless.*

Genus **ARVICOLA,** Lacépède[1].

Molars rootless (rarely semirooted), separated into prisms, which are placed alternately.

Arvícola amphíbius (Linn.[2]).

Syn. *Mus amphibius,* Linn.[3]

Four outer and five inner angles in first lower molar; three outer and two inner angles in second upper molar; molars rootless throughout life.

Hab. Europe and North Asia.

15081. (*Fig.*) Anterior portion of the cranium and three imperfect rami of the mandible; from Kent's-Hole Cavern, Torquay. The cranium and one ramus of the mandible are figured by Owen in the Brit. Foss. Mammals and Birds, p. 201, fig. 76.

McEnery Collection. Purchased, 1842.

[1] Mém. de l'Institut, vol. iii. p. 495 (1801).

[2] Syst. Nat. ed. 12, vol. i. p. 82 (1766), *Mus.* [3] *Loc. cit.*

54 (O. C.) The middle portion of the cranium, the left ramus of the mandible, the ulna, innominate, femur, and tibia; from Kirkdale Cave, Yorkshire.

Presented by W. Salmond, Esq. Before 1836.

30518–9. Seven rami of the mandible; from the Pleistocene of Mayence. *Hastings Collection. Purchased*, 1855.

35682. The greater portion of the right ramus of the mandible; from Kirkdale Cave. *Bean Collection. Purchased*, 1859.

55 (O. C.). Part of the right ramus of the mandible and some detached teeth; from the Bromberg Cave, Posen.

Sömmering Collection. Purchased, 1827.

M. 1125. Anterior portion of the right ramus of the mandible of an *Arvicola*, apparently belonging to a small individual of the present species; from the Forest-bed of West Runton, near Cromer, Norfolk.

Presented by W. Barker, Esq., 1883.

17643. A considerable portion of the skeleton; from the Forest-bed of Ostend, near Bacton, Norfolk.

Green Collection. Purchased, 1843.

15944, 17641, 17626, 18231. Numerous specimens of the upper and lower jaws; from the Forest-bed of Ostend. There are numerous other specimens from this locality in the same collection, which it has been considered unnecessary to enter in this Catalogue.

Green Collection. Purchased, 1843.

36568. Two fragments of the mandible; said to have been obtained from the Eocene clay of Kyson, Suffolk. There is every probability that these specimens were introduced.

Purchased, 1853.

Arvicola ambiguus, Pomel[1].

Syn. *Arvicola gulielmi*, Sanford[2].

Five outer and six inner angles in the first lower molar; four outer and three inner angles in the second upper molar. This

[1] Catalogue Méthodique, p. 27 (1853).

[2] Quart. Journ. Geol. Soc. vol. xxvi. p. 125 (1870).

species is slightly smaller than *A. amphibius*. There seems no reasonable doubt of the identity of *A. ambiguus* with *A. gulielmi*.

Hab. Europe.

21501. The cranium, mandible, and tibia; from the Pleistocene of Eppelsheim, Hesse-Darmstadt. *Purchased*, 1847.

55 b (O. C.). The first lower molar; from the Bromberg Cave, Posen. *Sömmering Collection. Purchased*, 1827.

Arvicola ratticeps, Keys. and Blasius[1].

Syn. *Lemmus medius*, Nilsson.

Four outer and five inner angles in the first lower molar; three outer and two inner angles in the second upper molar; the first angle of $\overline{\text{m. 1}}$ very large; molars rootless throughout life.

Hab. Europe.

55 a (O. C.). The greater part of the right ramus of the mandible, showing the incisor and the first and second molars; from the Bromberg Cave, Posen.

Sömmering Collection. Purchased, 1827.

Arvicola agrestis (Linn.[2]).

Syn. *Mus agrestis*, Linn.[3]
Mus gregarius, Linn.[4]

Five outer and six inner angles in the first lower molar; three angles on either side of the second upper molar; molars rootless throughout.

Hab. Europe.

15084. (*Fig.*) The greater portion of the right ramus of the mandible, and the tibia; from Kent's-Hole Cavern, Torquay. These specimens are figured by Owen in the Brit. Foss. Mammals and Birds, p. 206, fig. 77.

McEnery Collection. Purchased, 1842.

15084 a. Numerous fragments of the upper and lower jaws; from Kent's-Hole Cavern.

McEnery Collection. Purchased, 1842.

30520. Two rami of the mandible; from the Pleistocene of Mayence.

Hastings Collection. Purchased, 1855.

[1] Mém. Ac. Imp. St. Pétersbourg, vol. iv. p. 333 (1841).
[2] Fauna Suecica, ed. alt. p. 11 (1761), *Mus.*
[3] *Loc. cit.*
[4] Syst. Nat. ed. 12, vol. i. p. 84 (1766).

Arvicola glareolus (Schreber[1]).

Syn. *Mus glareolus*, Schreber[2].
Arvicola pratensis, Baillon[3].
Arvicola riparia, Yarrell[4].

Four outer and five inner angles in the first lower molar; three outer and two inner angles in the second upper molar; molars rooted in adult.

Hab. Europe.

48924–5. Numerous specimens of the cranium and mandible; from Brixham Cave, near Torquay.
Brixham-Cave Collection. Presented, 1876.

15095. (*Fig.*) Anterior portion of the cranium, and the left ramus of the mandible; from Kent's-Hole Cavern, Torquay. These specimens are figured by Owen in the Brit. Foss. Mammals and Birds, p. 208, fig. 78, under the name of *Arvicola pratensis*. *McEnery Collection. Purchased*, 1842.

Arvicola, sp.

Hab. Europe.

48190. Fragments of the cranium and mandible; from the Middle Miocene of Steinheim, Bavaria. These specimens indicate an animal of the size of *A. glareolus*, and having the same number of angles in the first lower molar; but they are probably insufficient for specific determination. No species of the genus is mentioned by Fraas in the 'Fauna von Steinheim' (1870). *Purchased*, 1877.

Family SPALACIDÆ.

Genus **RHIZOMYS**, Gray[5].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{0}{0}$, M. $\frac{3}{3}$.

Rhizomys sivalensis, Lydekker[6].

Syn. (?) *Typhlodon*, Falconer[7].

Hab. India.

15925. Part of the right ramus of the mandible, containing the three molars; from the Pliocene of the Siwalik Hills.

[1] Säugeth. vol. iii. p. 680 (1774), *Mus*. [2] *Loc. cit.*
[3] In F. Cuvier's Hist. Nat. Mamm. vol. iv. pt. lxviii. p. 2 (1834).
[4] Proc. Zool. Soc. 1832, p. 109. [5] Proc. Zool. Soc. 1831, p. 95.
[6] Rec. Geol. Surv. Ind. vol. xi. p. 101 (1878).
[7] Falconer's Palæontological Memoirs, vol. i. p. 23 (1868).

India. This and the next specimen are slightly larger than the type specimen (woodcut, fig. 31); but as they are otherwise precisely similar, they have been provisionally referred by the present writer, in the 'Palæontologia Indica,' ser. 10, vol. iii. p. 107, to the same species. The length of the space occupied by the three molars is 0,019.

Cautley Collection. Presented, 1842.

Fig. 31.

m. 1. *m.* 2. *m.* 3.

Rhizomys sivalensis.—Part of the left ramus of the mandible; from the Siwaliks of the Punjab. Indian Museum, Calcutta. $\frac{2}{3}$. (From the 'Palæontologia Indica.')

15926. Part of the right ramus of the mandible, containing the second molar and the broken bases of the teeth on either side; from the Pliocene of the Siwalik Hills.

Cautley Collection. Presented, 1842.

15927. Fragment of the left ramus of the mandible, containing the first and second molars, in a more worn condition than in either of the preceding specimens; from the Pliocene of the Siwalik Hills. *Cautley Collection. Presented*, 1842.

15927 a. Two molar teeth; from the Pliocene of the Siwalik Hills.

Cautley Collection. Presented, 1842.

Section HYSTRICOMORPHA.

Family THERIDOMYIDÆ.

This family was established by Alston[1] for the reception of the genera *Theridomys*, *Archæomys*, and *Issiodoromys*. Schlosser[2] considers that the first two genera, together with *Protechinomys* and *Trechomys*, are most nearly allied to the existing *Octodontidæ* (*Loncheres* and *Echinomys*); while he refers[3] *Issiodoromys* and the allied *Nesocerodon* to the *Caviidæ* (*Dolichotis*). This arrangement has been adopted here.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

[1] Proc. Zool. Soc. 1876, p. 88.

[2] Palæontographica, vol. xxxi. p. 33 (1884).

[3] *Ibid.* p. 15.

Genus **THERIDOMYS**, Jourdan[1].

Cheek-teeth rooted, with three or four reentering enamel-folds, which become isolated enamel-loops on the worn crowns (*Alston*). The structure of the cheek-teeth approaches that of some species of *Loncheres* and *Echinomys*; the humerus referred to the fossil differs from that of the recent genera in possessing a supracondylar perforation.

Theridomys lembronicus (Bravard[2]).

Syn. *Neomys lembronicus*, Bravard[3].
Theridomys dubius, Pomel[4].

This species is of relatively large size; on the worn crowns of the upper cheek-teeth the large internal enamel-fold persists, and there are four enamel-islands on the outer side.
Hab. Europe.

34946. The palate, showing the cheek-teeth of both sides; from the Lower Miocene of Antoin (Puy-de-Dôme), France. This specimen agrees very closely with the one figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvii. figs. 1, 1 *a*. The length of the space occupied by the four cheek-teeth is 0,011.
Bravard Collection. Purchased, 1852.

34922. The cheek-dentition of the left side; from the Lower Miocene of Antoin. *Bravard Collection. Purchased*, 1852.

34924. The first three cheek-teeth of the right side, in a well-worn condition; from the Lower Miocene of Antoin.
Bravard Collection. Purchased, 1852.

27760. The palate, showing the cheek-dentition of both sides; from the Lower Miocene of Sauvetat (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

27715. The right ramus of the mandible, showing the incisor and the two first cheek-teeth; from the Lower Miocene of St. Yvoine (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

[1] Comptes Rendus, vol. v. p. 483 (1837).
[2] Consid. s. la Distrib. d. Mamm. Foss. du Puy-de-Dôme, p. 40 (1844), *teste* P. Gervais, *Neomys*.
[3] *Loc. cit.*
[4] Catalogue Méthodique, p. 34 (1853).

27638. Part of the left ramus of the mandible, showing all the teeth; from the Lower Miocene of St. Yvoine. The length of the space occupied by the four cheek-teeth in this specimen is 0,012. *Croizet Collection. Purchased*, 1848.

27757. The lower cheek-teeth of the right side: from the Lower Miocene of Perrier (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

26718. Part of the left ramus of the mandible, showing the incisor and the first three cheek-teeth; from the Lower Miocene of Perrier. *Pomel Collection. Purchased*, 1851.

27757. Part of the right ramus of the mandible, showing the incisor and the first three cheek-teeth; from the Lower Miocene of Perrier. The teeth are of large size; and this is probably one of the specimens on which Pomel founded his *T. dubius*. *Croizet Collection. Purchased*, 1848.

34956. The nearly complete left ramus of the mandible; from the Lower Miocene of Antoin. This specimen agrees exactly with the one figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvii. figs. 3, 3 *a*.
Bravard Collection. Purchased, 1852.

34949. The greater part of the right ramus of the mandible, containing the four cheek-teeth; from the Lower Miocene of Antoin. *Bravard Collection. Purchased*, 1852.

34940. The left ramus of the mandible; from the Lower Miocene of Antoin. *Bravard Collection. Purchased*, 1852.

34927. Part of the left ramus of the mandible, showing all the dentition, with the roots of the molars exposed; from the Lower Miocene of Antoin.
Bravard Collection. Purchased, 1852.

34948. Part of the right ramus of the mandible, with all the dentition; from the Lower Miocene of Antoin.
Bravard Collection. Purchased, 1852.

34931. Fragment of the left ramus of the mandible, containing three cheek-teeth; from the Lower Miocene of Antoin.
Bravard Collection. Purchased, 1852.

34931 a. Fragment of the left ramus of the mandible, containing the incisor and three cheek-teeth; from the Lower Miocene of Antoin. *Bravard Collection. Purchased*, 1852.

27760. Three fragments of the mandible; from the Lower Miocene of Sauvetat. *Croizet Collection.* *Purchased*, 1848.

27636. Part of the left ramus of the mandible, showing the first three cheek-teeth and the complete incisor; from the Lower Miocene of Sauvetat.
Croizet Collection. *Purchased*, 1848.

34944–5. Fragments of the cranium and mandible; from the Lower Miocene of Antoin.
Bravard Collection. *Purchased*, 1852.

Theridomys aquatilis, Aymard[1].

Syn. *Theridomys jourdani*, Aym. (*non* Gieb.).
Isoptychus jourdani, Pomel[2].
Isoptychus aquatilis, Pomel[3].
? *Theridomys rotundidens*, Schlosser[4].
? *Theridomys cuvieri*, Pomel.

This species is considerably smaller than the last, the average length of the space occupied by the upper cheek-teeth being 0,008, and that by the lower 0,010. The four cheek-teeth are nearly equal in size, and there are only three distinct enamel-islands on the worn crowns of the upper teeth.

Hab. Europe.

27756. The palatal portion of the cranium, showing the left incisor and the four cheek-teeth of either side; from the Lower Miocene of Cournon (Puy-de-Dôme), France. This specimen agrees precisely with the one figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvi. figs. 7, 7*a*, and by Filhol in the Ann. Sci. Géol. vol. xii. pl. vi. fig. 12. The length of the space occupied by the four cheek-teeth is 0,009.
Croizet Collection. *Purchased*, 1848.

27756 a. The nearly complete left ramus of the mandible, containing the incisor and the four cheek-teeth; from the Lower Miocene of Cournon. This specimen agrees very closely with the mandibles figured by P. Gervais (*op. cit.* fig. 6) and Filhol (*op. cit.* fig. 14). The length of the space occupied by the four cheek-teeth is 0,010.
Croizet Collection. *Purchased*, 1848.

[1] Ann. Soc. Agric. Sci. le Puy, vol. v, p. 82 (1850), *teste* Filhol.

[2] Catalogue Méthodique, p. 35 (1853). This species is identified with *aquatilis* on the authority of Filhol, Ann. Sci. Géol. vol. xii. art. 3, pp. 14, 16.

[3] *Ibid.*

[4] Palæontographica, vol. xxxi. p. 38 (1884).

27635. Two specimens of part of the upper and lower dentition; from the Lower Miocene of Sauvetat (Puy-de-Dôme).
Croizet Collection. Purchased, 1848.

27760. Several specimens of the upper and lower jaws; from the Lower Miocene of Sauvetat. One specimen of the mandible shows the milk-molars.
Croizet Collection. Purchased, 1848.

27760 a. Part of the left ramus of the mandible of an immature individual, showing the premolar partly protruded; from the Lower Miocene of Sauvetat.
Croizet Collection. Purchased, 1848.

27760 b. The first three right lower cheek-teeth of a young individual, with the milk-molar *in situ*; from the Lower Miocene of Sauvetat. *Croizet Collection. Purchased*, 1848.

27694 a. Part of the left ramus of the mandible; from the Lower Miocene of Puy-de-Dôme. *No history.*

M. 1628. The greater part of the left ramus of the mandible, showing the four cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees in size with the one from Ronzon figured by Filhol in the Ann. Sci. Géol. vol. xii. pl. vi. fig. 16. Schlosser[1] refers a very similar specimen from the Upper Eocene of Caylux to the new species *T. rotundidens*, remarking that the only difference from *T. aquatilis* consists in its slightly smaller dimensions. This distinction does not appear of specific value. Filhol (Ann. Sci. Géol. vol. viii. art. 1, p. 302) records the present species from Caylux. *Purchased*, 1884.

Specimens provisionally referred to the present Species.

Schlosser[2] and Filhol[3] refer the species of *Theridomys* from the Upper Eocene of Vaucluse to *T. siderolithicus*, Pictet (*T. vaillanti*, P. Gervais), and *T. cuvieri*, Pomel; but the writer has not been able to distinguish the specimens from those deposits mentioned below from the present species. Seeing that *T. aquatilis* occurs in the phosphorites, there is no reason why it should not also occur in the Vaucluse beds. Schlosser is, indeed, inclined to identify the Vaucluse *T. cuvieri* with his *T. rotundidens*, which the present writer cannot distinguish from *T. aquatilis*.

[1] Palæontographica, vol. xxxi. p. 38 (1884). [2] *Ibid.*
[3] Ann. Sci. Géol. vol. viii. art. 1, p. 320.

28137. Part of the left ramus of the mandible, containing the four cheek-teeth; from the Upper Eocene of Vaucluse, France. This specimen agrees precisely with the Lower Miocene specimen No. 27756 *a*.

Bravard Collection. Purchased, 1852.

26730. Fragment of the left ramus of the mandible, containing the first three cheek-teeth; from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

28147. Part of the left ramus of the mandible, containing the four cheek-teeth; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

28146. Part of the left ramus of the mandible, containing the four cheek-teeth; from the Upper Eocene of Vaucluse.

Bravard Collection. Purchased, 1852.

28136. Fragment of the right ramus of the mandible of an immature individual, containing two cheek-teeth, the first of which is the milk-molar; from the Upper Eocene of Vaucluse. *Bravard Collection. Purchased*, 1852.

30159 a. Numerous fragments of the maxilla and mandible, with the cheek-teeth; from the Headon beds (Upper Eocene) of Hordwell, Hants. These teeth apparently agree precisely with those of the continental specimens of *T. aquatilis*. *Hastings Collection. Purchased*, 1855.

25228. Cranium, with the cheek-teeth in a very much worn condition; from the Headon beds of Hordwell. Owing to their worn condition the cheek-teeth of this specimen do not exhibit the characteristic marking; but from the resemblance of the specimen in other respects to the cranium of *T. aquatilis*, there seems little doubt but that it belongs to the same species.

Presented by S. V. Wood, Esq., 1850.

36797. The greater part of the left ramus of the mandible, with the cheek-teeth in an almost unworn condition; from the Headon beds of Hordwell.

Presented by S. Laing, Esq., 1862.

40212. The greater part of the right ramus of the mandible of a small individual, showing the four cheek-teeth; from the Headon beds of Hordwell. *Purchased*, 1867.

30322. Part of the left ramus of the mandible; from the Headon beds of Hordwell. This specimen is slightly larger than the preceding specimens, but probably belongs to the same species. *Hastings Collection. Purchased*, 1855.

28905 a. Four upper cheek-teeth, not improbably belonging to a large individual of the present species; from the Headon beds of Headon Hill, Isle of Wight. The crowns of the teeth do not exhibit the characteristic pattern sufficiently clearly to be sure of the specific determination.
Presented by F. E. Edwards, Esq., 1854.

36798. Numerous detached teeth; from the Headon beds of Hordwell.
Presented by S. Laing, Esq., 1862.

Genus **PROTECHINOMYS,** Schlosser[1].

Cheek-teeth very like those of *Archæomys*, but rooted; they also resemble those of some species of *Echinomys* (e. g. *E. leptosoma*, Wagner).

Protechinomys major, Schlosser[2].

The worn upper cheek-teeth exhibit either three or four bands of enamel.

Hab. France.

M. 1348 e. Several specimens of the maxilla; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. These specimens agree precisely with those figured by Schlosser (*loc. cit.* pl. v. figs. 3, 4, 15), exhibiting three bands of dentine on the crowns of the molars. *Purchased*, 1884.

M. 1347. Several specimens of the maxilla; from the Upper Eocene of Caylux. These specimens exhibit four bands of dentine on the crowns of the molars, but agree otherwise with the type forms. *Purchased*, 1884.

M. 1347 a. Numerous rami of the mandible; from the Upper Eocene of Caylux. Most of these specimens agree with the specimens figured by Schlosser (*loc. cit.* pl. v. figs. 1, 17, 20); but some of the smaller ones may correspond with his *P. gracilis*, if that form be really distinct.
Purchased, 1884.

[1] Palæontographica, vol. xxxi. p. 45 (1884), *Protechimys*.
[2] *Ibid.* p. 48.

Protechinomys gracilis, Schlosser[1].

This is a smaller species than the last.

Hab. France.

M. 1348 b. Fragment of the maxilla; from the Lower Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees with the one figured by Schlosser, *loc. cit.* pl. v. figs. 14, 23. *Purchased*, 1884.

Protechinomys breviceps (Laizer and Parieu[2]).

Syn. *Echinomys breviceps*, Laizer and Parieu[3].
Echinomys curvistriatus, Laizer and Parieu[4].
Theridomys breviceps, P. Gervais[5].
Theridomys jourdani, Giebel[6].
(?) *Theridomys blainvillei*, P. Gervais[7].

Schlosser (*loc. cit.* p. 41) observes that *Theridomys blainvillei* undoubtedly belongs to *Protechinomys*, and that it is most probably identical with *T. breviceps*, which he likewise refers to *Protechinomys* (*loc. cit.* p. 42). In a partially worn condition the upper molars show three oblique bands of dentine. The species is about the size of *Theridomys aquatilis*.

Hab. France.

27760. Part of the cranium, showing the cheek-dentition of the right side; from the Lower Miocene of Sauvetat (Puy-de-Dôme), France. This and the next specimen agree in all essential characters with the one figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvii. figs. 17, 17*a*, under the head of *Theridomys blainvillei*; but the length of the space occupied by the cheek-teeth is slightly less. *Croizet Collection. Purchased*, 1848.

27702. The left upper cheek-dentition; from the Lower Miocene of Sauvetat. *Croizet Collection. Purchased*, 1848.

27760 a, 27712, 34900. Numerous specimens of rami of the mandible, several of which are nearly perfect; from the Lower

[1] Palæontographica, vol. xxxi. p. 46 (1884).
[2] Comptes Rendus, vol. viii. p. 206 (1839), *Echi*[*no*]*mys*.
[3] *Loc. cit.*
[4] *Ibid.* p. 25. This name has the priority, but *breviceps* is very generally adopted.
[5] Zool. et Pal. Françaises, 2nd ed. p. 31 (1859).
[6] Fauna der Vorwelt, vol. i. p. 96 (1847).
[7] Zool. et Pal. Françaises, 1st ed. vol. ii., explan. pl. xlvii. (1848–52).

Miocene of Sauvetat. The teeth of these specimens agree precisely with those figured by Gervais (*op. cit.* figs. 18, 18*a*), and are provisionally referred to *Protechinomys breviceps*.

Bravard and Croizet Collections. Purchased, 1848–52.

27689. The palate, showing the cheek-dentition of both sides; from the Lower Miocene of St. Yvoine (Puy-de-Dôme).

Croizet Collection. Purchased, 1848.

27757. The right upper cheek-dentition; from the Lower Miocene of Perrier (Puy-de-Dôme).

Croizet Collection. Purchased, 1848.

Genus **ARCHÆOMYS**, Laizer and Parieu[1].

Cheek-teeth rootless; the enamel-folds continuing across the crown and dividing it into laminæ; the laminæ are subequal in the lower teeth, but in the upper the first lamina is the largest. The genus is connected by the last with *Theridomys*, and leads on to the *Chinchillidæ*.

Archæomys laurillardi, P. Gervais[2] (*ex* Brav.).

This is the largest species; there are four laminæ of dentine on the worn crowns of the upper molars.

Hab. France.

25099. Fragment of the cranium, showing the cheek-dentition of the left side; from the Lower Miocene of Cournon (Puy-de-Dôme), France. This specimen agrees with the type cranium figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvii. figs. 15, 15*a*, with the exception that the length of the space occupied by the four cheek-teeth is somewhat less.

Croizet Collection. Purchased, 1848.

25100. Part of the right ramus of the mandible, containing the four cheek-teeth; from the Lower Miocene of Cournon.

Croizet Collection. Purchased, 1848.

25098. Fragment of the palate, containing some of the cheek-teeth; from the Lower Miocene of Cournon.

Croizet Collection. Purchased, 1848.

27674. Fragment of the left maxilla, containing the first three

[1] Comptes Rendus, vol. viii. p. 206 (1839).

[2] Zool. et Pal. Françaises, 1st ed. vol. ii., explanation of pl. xlvii. (1848–52).

cheek-teeth; from the Lower Miocene of the neighbourhood of Clermont (Puy-de-Dôme).

Croizet Collection. *Purchased*, 1848.

27713. Part of the palate, containing the first three cheek-teeth of the right side; from the Lower Miocene of Perignat (Puy-de-Dôme). *Croizet Collection.* *Purchased*, 1848.

34898. The nearly complete left ramus of the mandible; from the Lower Miocene of Perignat.

Bravard Collection. *Purchased*, 1852.

34899. The greater part of the right ramus of the mandible; from the Lower Miocene of Perignat.

Bravard Collection. *Purchased*, 1852.

27634. Fragment of the right ramus of the mandible, containing the premolar; from the Lower Miocene of Perignat.

Croizet Collection. *Purchased*, 1848.

Genus **TRECHOMYS**, Lartet[1].

Upper cheek-teeth with four outer and one or two inner enamel-folds; lower teeth usually with three inner and one outer enamel-fold. The general structure of the cheek-teeth is somewhat similar to that of *Theridomys*, but the incisors are distinguished by their lateral compression.

Trechomys platyceps (Filhol[2]).

Syn. *Theridomys platyceps*, Filhol[3].
Trechomys insignis, Schlosser[4].

Schlosser had some doubts whether his *Trechomys insignis* was the same as Filhol's *Theridomys platyceps*: the specimens in the Museum show decisively that this is the case.

Hab. France.

M. 1627. Two fragments of the maxilla, showing some of the cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. These specimens agree precisely with the maxilla figured by Schlosser, *loc. cit.* pl. iii. figs. 16, 23.

Purchased, 1884.

[1] Ann. Sci. Nat. vol. xii. p. 151 (1869).
[2] Ann. Sci. Géol. vol. vii. art. 7, p. 50 (1876).
[3] *Loc. cit.*
[4] Palæontographica, vol. xxxi. p. 54 (1884).

M. 1627 a. Five rami of the mandible; from the Upper Eocene of Caylux. These specimens agree with the mandible figured by Filhol in the Ann. Sci. Géol. vol. vii. pl. xii. fig. 16, and also with the less perfect one figured by Schlosser, *loc. cit.* pl. iii. figs. 6, 11. The length of the space occupied by the four cheek-teeth in the specimen in which the premolar is present is 0,0121, and the depth of the ramus at the second true molar 0,009. *Purchased*, 1884.

Trechomys intermedius, Schlosser [1].

This species is smaller than the last.

Hab. France.

M. 1348 a. Part of the right ramus of the mandible, showing the four cheek-teeth and the incisor; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees precisely with the type mandible figured by Schlosser, *loc. cit.* pl. iii. figs. 21, 24, 28. *Purchased*, 1884.

Family OCTODONTIDÆ [2].

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$; except in *Ctenodactylus* (Pm. $\frac{0}{0}$).

Genus **LONCHERES,** Illiger [3].

Loncheres, sp.

Hab. S. America.

18898. Anterior extremity of the left ramus of the mandible, showing the incisor and the first two cheek-teeth; from a cavern in Minas Geraes, Brazil. H. Gervais and Ameghino [4] mention one fossil species under the name of *L. affinis elegans*. *Claussen Collection*. *Purchased*, 1845.

Genus **CARTERODON,** Waterhouse [5].

Incisors broad and furrowed longitudinally; upper cheek-teeth with one inner and two outer enamel-folds; the lower similar, but reversed. The genus was originally described from a fossil, but has subsequently been found existing.

[1] Palæontographica, vol. xxxi. p. 55 (1884).

[2] It is not improbable that this family should be fused with the last.

[3] Prodromus Syst. Mamm. p. 90 (1811).

[4] Les Mammifères fossiles de l'Amérique du Sud, p. 59 (1880).

[5] Natural History of the Mammalia, vol. ii. p. 351 (1848).

Carterodon sulcidens (Lund[1]).

Syn. *Echi[no]mys sulcidens*, Lund[2].

Hab. S. America.

17617. (*Fig.*) The cranium, wanting the left incisor and the last true molars; from a cavern in Minas Geraes, Brazil. This specimen, which is the type of the genus, is described and figured by Waterhouse in the 'Natural History of the Mammalia,' vol. ii. p. 352, pl. xvi. fig. 7.

Claussen Collection. Purchased, 1845.

17619. Cranium, covered with calcareous incrustation; from a cavern in Minas Geraes.

Claussen Collection. Purchased, 1845.

17618. Anterior portion of the cranium, with three cheek-teeth remaining; from a cavern in Minas Geraes.

Claussen Collection. Purchased, 1845.

17620. The greater portion of the cranium, with five cheek-teeth remaining; from a cavern in Minas Geraes.

Claussen Collection. Purchased, 1845.

17621. (*Fig.*) Two specimens of the left ramus of the mandible; from a cavern in Minas Geraes. One of these specimens is figured by Waterhouse, *op. cit.* fig. 7 *a*.

Claussen Collection. Purchased, 1845.

18891. Five rami of the mandible; from a cavern in Minas Geraes.

Claussen Collection. Purchased, 1845.

17620 a. Anterior portion of the cranium, with one much-worn molar remaining; from a cavern in Minas Geraes.

Claussen Collection. Purchased, 1845.

Genus **CTENOMYS**, Blainville[3].

Incisors broad. Cheek-teeth rootless, with kidney-shaped crowns; the third true molar above and below small and subcylindrical (*Alston*).

Ctenomys, sp. 1.

Hab. S. America.

40675 a. Several broken rami of the mandible and incisors; from the Pleistocene of Buenos Ayres. Four fossil species belonging to this genus are recorded by H. Gervais and Ameghino from South America.

Bravard Collection. Purchased, 1854.

[1] K. Danske Vid. Selsk. Skr. vol. viii. p. 99 (1841), *Echimys*. [2] *Loc. cit.*

[3] Bull. Soc. Philom. Paris, 1826, p. 24.

Ctenomys, sp. 2.

Hab. S. America.

40675 b. The associated cranium and mandible, in a somewhat broken condition; from the Pleistocene of Buenos Ayres. These specimens, which indicate a smaller species than the last, come very close to the existing *C. leucodon*.

Bravard Collection. Purchased, 1854.

Family HYSTRICIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **SYNETHERES,** F. Cuvier [1].

Syn. *Sphingurus*, F. Cuvier [2].
Cercolabes, Brandt [3].

The teeth of this genus can only be distinguished from those of *Erethizon* by the circumstance that in the latter the first tooth of the cheek-series is considerably longer than the last, whereas in the former all the teeth are subequal.

Synetheres fossilis (Waterhouse [4]).

Syn. *Cercolabes fossilis*, Waterhouse [5].
(?) *Synetheres magnus*, Lund [6].

As the remains on which this species is founded do not show the first tooth of the cheek-series, it is impossible to say whether it really belongs to *Synetheres* or *Erethizon*. On distributional grounds it is, however, more probable that it belongs to the former, to which it is accordingly provisionally referred. In size it considerably exceeds the existing *Erethizon dorsatus*, and is therefore very much larger than any of the existing species of *Synetheres*.

Hab. S. America.

18869. Two fragments of the opposite rami of the mandible; from the caverns of Minas Geraes, Brazil. The more perfect specimen shows the three true molars, and the less perfect

[1] Mém. d. Muséum, vol. ix. p. 413 (1822), *Synéthère*.
[2] *Loc. cit.*, *Sphingure*.
[3] Mém. Ac. Imp. St. Pétersbourg, ser. 6, vol. iii. p. 391 (1835).
[4] Natural History of the Mammalia, vol. ii. p. 436 (1848), *Cercolabes*.
[5] *Loc. cit.*
[6] K. Danske Vid. Selsk. Skr. vol. vii. p. 250 (1840).

the first and second true molars, the teeth in both specimens being in an early stage of wear and in beautiful preservation. The specimens are provisionally referred by Waterhouse, in the passage quoted, to the present genus, and are said to be too small to belong to Lund's *S. magnus*; the description of that form seems, however, to be too vague to be certain on this point. The following dimensions show the length of the space occupied by the three true molars in the more perfect fossil and in two specimens of the existing *Erethizon dorsatus*, viz. :—

S. fossilis.	*E. dorsatus.*
0,0238	0,0208–0,0195.

The superior size of these specimens probably indicates at least their specific distinction from *Erethizon dorsatus*. If they are identical with *Synetheres magnus*, that name has the priority over *S. fossilis*.

Claussen Collection. Purchased, 1845.

Genus **HYSTRIX**, Linn.[1]

The teeth of this genus are indistinguishable from those of *Atherura*; but none of the living species of the latter attain anything like the dimensions of the larger species of *Hystrix*.

Hystrix refossa, P. Gervais[2].

Syn. *Hystrix major*, P. Gervais[3] (*teste* Schlosser).

Hab. France.

34958–9. A right upper premolar and a first or second left upper true molar[4]; from the Upper Pliocene of Perrier (Puy-de-Dôme), France. The premolar appears to agree exactly with the lower premolar figured by P. Gervais in the Zool. et Pal. Françaises, pl. xlviii. fig. 11, and both specimens agree with the type in the complexity of the enamel-folds: they appear rather larger than average specimens of *H. cristata*, and thereby approach the Pleistocene so-called *H. major*. *Bravard Collection. Purchased*, 1854.

34957. Fragment of the base of the incisor, associated with the above. *Bravard Collection. Purchased*, 1854.

[1] Syst. Nat. ed. 12, vol. i. p. 76 (1766).

[2] Zool. et Pal. Françaises, 1st ed. vol. ii., explanation of pl. xlviii. (1848–52).

[3] Zool. et Pal. Générales, 1st ser. p. 76 (1876–79).

[4] Entered in the Register as *Castor claveris*, Bravard, MS.

Hystrix, sp.

Hab. Italy.

29692. The right upper premolar; from the Upper Pliocene of the Val d'Arno, Italy. This specimen is smaller than *H. refossa* (No. 34959), and the folds of the enamel are apparently simpler. *Presented by the Earl of Enniskillen*, 1855.

29692 a. Terminal portion of an incisor; from the Upper Pliocene of the Val d'Arno. *Egerton Collection. Purchased*, 1882.

Hystrix sivalensis, Lydekker [1].

This species is founded on the evidence of a fragment of the mandible, from the Siwaliks of the Punjab, India, figured in the accompanying woodcut (fig. 32), and is described by the writer in the

Fig. 32.

pm. 4. *m.* 1. *m.* 2. *m.* 3.

Hystrix sivalensis.—Fragment of the right ramus of the mandible; from the Siwaliks of the Punjab. ½. Indian Museum, Calcutta. (From the 'Palæontologia Indica.')

'Palæontologia Indica,' ser. 10, vol. iii. p. 109; the characteristic point of the specimen being the short crowns of the cheek-teeth.

Hab. India.

15923. (*Fig.*) The greater portion of the cranium and mandible of a young Porcupine; from the Pliocene of the Siwalik Hills, India. This specimen, of which the cranium is figured in the accompanying woodcut (fig. 33), has been described and figured by the present writer in the 'Palæontologia Indica,' ser. 10, vol. iii. pp. 110, 111, and provisionally referred to the present species. The cranium has suffered considerably from crush, and has lost the nasals and a part of the maxilla. In the upper jaw there are only two teeth, and but three in the lower; thus showing that the

[1] Rec. Geol. Surv. Ind. vol. xi. p. 100 (1878).

specimen is not adult. The first tooth in each jaw is the premolar, and the second the first true molar. On the left side of the mandible the whole length of the crown of $\overline{m.1}$

Fig. 33.

Hystrix sivalensis (?).—Left lateral aspect of the cranium of a young individual, with the nasals restored; from the Siwalik Hills. ¼. (From the 'Palæontologia Indica.')

is exposed; and it is thus seen that in its lower part the dimensions of this tooth are similar to those of the corresponding tooth of the type mandible represented in fig. 32.

Presented by Generals Sir W. E. Baker, K.C.B., and Sir H. M. Durand, K.C.B., 1848.

Family CHINCHILLIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **LAGOSTOMUS**, Brookes[1].

Lagostomus trichodactylus, Brookes[2].

Hab. S. America.

M. 1339. The cranium, mandible, and greater portion of the skeleton; from the Pleistocene of Buenos Ayres. *Purchased*, 1882.

43246. Part of the cranium and mandible; from the Pleistocene of Buenos Ayres. *Presented by Señor L. J. Fontana*, 1871.

[1] Trans. Linn. Soc. vol. xvi. p. 102 (1828). [2] *Loc. cit.*

43246 a. Greater portion of the cranium; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

43246 b. Numerous limb-bones and vertebræ; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

43246 c. The nearly complete hind foot; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

Family DASYPROCTIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **DASYPROCTA**, Illiger [1].

Syn. *Chloromys*, Cuvier (*non* Meyer).

The existing species resemble one another so closely in dental and cranial characters that it seems impossible to apply specific names to fossil forms.

Dasyprocta, sp.

Hab. S. America.

18869. Occipital portion of the cranium; from a cavern in Minas Geraes, Brazil. *Claussen Collection. Purchased*, 1845.

18871. Premaxillæ and incisors; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

18894. Two specimens of the palate, and three rami of the mandible; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

18894 a. The tarsus; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

Genus **CŒLOGENYS**, F. Cuvier [2].

Cœlogenys paca (Linn.[3]).

Syn. *Mus paca*, Linn.[4]

Hab. S. America.

18690. The cranium of a female, imperfect posteriorly; from a

[1] Prod. Syst. Mam. et Avium, p. 93 (1811).
[2] Ann. d. Muséum, vol. x. p. 203 (1807), *Cœlogenus*.
[3] Syst. Nat. ed. 12, vol. i. p. 81 (1766), *Mus*. [4] *Loc. cit.*

cavern in Minas Geraes, Brazil. This specimen is of the size of the skull of a full-sized living Paca, with which it agrees in every respect. It probably corresponds to the so-called *C. major* of Lund, with which *C. laticeps*, Lund, hould probably be united.

Claussen Collection. Purchased, 1845.

18868. Five rami of the mandible; from a cavern in Minas Geraes.
Claussen Collection. Purchased, 1845.

17572, 17590. Two specimens of the humerus; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

17579. The left ulna; from a cavern in Minas Geraes.
Claussen Collection. Purchased, 1845

17577–8. Two specimens of the left femur; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

17574. Two specimens of the left tibia; from a cavern in Minas Geraes. *Claussen Collection. Purchased*, 1845.

Family CAVIIDÆ.

Dentition:—I. $\frac{1}{1}$, C. $\frac{0}{0}$, Pm. $\frac{1}{1}$, M. $\frac{3}{3}$.

Genus **CAVIA**, Pallas[1] (*ex* Klein).

Cavia porcellus (Linn.[2]).

Syn. *Mus porcellus*, Linn.[3]
(?) *Cavia aperea*, Gmelin.
? *Cavia aperoides*, Lund.

Hab. S. America.

18898. The distal portion of the left ramus of the mandible, containing the incisor and the first two cheek-teeth; from a cavern in Minas Geraes, Brazil. This specimen is indistinguishable from the mandible of the existing Guinea-pig. *Claussen Collection. Purchased*, 1845.

Genus **MICROCAVIA**, H. Gervais and Ameghino[4].

Microcavia, sp.

Hab. S. America.

18898 a. Six rami of the mandible; from the caverns of Minas

[1] Miscell. Zool. fasc. ii. p. 16 (1767).
[2] Syst. Nat. ed. 12, vol. i. p. 79 (1766), *Mus.* [3] *Loc. cit.*
[4] Mammifères fossiles de l'Amérique du Sud, p. 51 (1880).

Geraes, Brazil. In the absence of figures, it is impossible to say to which of the four species established by Gervais and Ameghino these specimens belong.

Claussen Collection. *Purchased*, 1845.

Genus **ISSIODOROMYS,** Blainville[1] (*ex* Croizet).

Cheek-teeth rootless, with open re-entering enamel-folds dividing their crowns into heart-shaped lobes; the subsidiary folds only represented here and there by a minute enamel-island. There has been considerable doubt as to the serial position of this genus. It was placed by Alston among the *Theridomyidæ*; but it is very closely allied to the next genus, which Schlosser considers allied to *Dolichotis*.

Issiodoromys pseudanæma, P. Gervais[2].

Syn. *Palanæma antiqua*, Pomel[3].

Hab. France.

27768. The palate, with the cheek-teeth; from the Lower Miocene of Perignat, near Issoire (Puy-de-Dôme), France.

Croizet Collection. *Purchased*, 1848

34901. The upper cheek-dentition; from the Lower Miocene of Sauvetat (Puy-de-Dôme).

Bravard Collection. *Purchased*, 1852.

34902. The nearly complete right ramus of the mandible; from the Lower Miocene of Sauvetat.

Bravard Collection. *Purchased*, 1852.

27691. Fragment of the left ramus of the mandible; from the Lower Miocene of Perignat.

Croizet Collection. *Purchased*, 1848.

26717. Part of the left ramus of the mandible, containing all the cheek-teeth; from the Lower Miocene of Cournon (Puy-de-Dôme). *Croizet Collection.* *Purchased*, 1848.

M. 1495. Fragment of the right ramus of the mandible, containing the anterior cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen is indistinguishable from No. 26717. The species is not recorded by Filhol or Schlosser from the phosphorites.

Purchased, 1884.

[1] Comptes Rendus, vol. x. p. 932, note (1840).
[2] Zool. et Pal. Françaises, 1st ed. vol. i. p. 27 (1848–52).
[3] Catalogue Méthodique, p. 41 (1853).

Genus **NESOCERODON**, Schlosser[1].

Cheek-teeth semi-rooted, otherwise very similar in general structure to *Issiodoromys*, from which the present writer is inclined to doubt the propriety of separating the genus. The structure of the teeth in different stages of wear is well exhibited in Schlosser's figures, *loc. cit.* pl. vii. It will be seen that the well-worn upper molars represented in fig. 12 present precisely the same general pattern as those of *Issiodoromys* figured by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. pl. xlvii. fig. 6 *a*.

Nesocerodon quercyi, Schlosser[2].

Hab. France.

M. 1348 d. Part of the right ramus of the mandible, containing the incisor and the first three cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees with the mandibles figured by Schlosser, *loc. cit.* pl. vii. figs. 1, 7, 21. *Purchased*, 1884.

Nesocerodon minor (Filhol[3]).

Syn. *Issiodoromys minor*, Filhol[4].

This species is smaller than the last, but it is not impossible that it will ultimately be found that there is a transition in this respect between the two; in which case the present name should stand for the species.

Hab. France.

M. 1631. Fragment of the left maxilla, containing the four cheek-teeth; from the Upper Eocene of Caylux (Tarn-et-Garonne), France. This specimen agrees very closely with the one described by Filhol, *loc. cit.*, and those figured by Schlosser, *loc. cit.* pl. vii. figs. 8, 16, 20. The length of the space occupied by the four cheek-teeth in the present specimen is 0,008, in Filhol's specimen 0,0075, and in Schlosser's specimens 0,007 and 0,0065. *Purchased*, 1884.

[1] Palæontographica, vol. xxxi. p. 16 (1884), *Nesokerodon*.
[2] *Loc. cit.* p. 19.
[3] Ann. Sci. Géol. vol. vii. art. 7, p. 52 (1876), *Issiodoromys*.
[4] *Loc. cit.*

Genus **DOLICHOTIS**, Desmarest[1].

Syn. *Cerodon*, Cuvier.

The last upper molar with three lobes.

Dolichotis, sp. 1.

Dolichotis minor, H. Gervais and Ameghino[2].

Hab. S. America.

40675 c. Palatal portion of the cranium, containing all the cheek-teeth; from the Pleistocene of Buenos Ayres. This species is considerably smaller than the existing *D. patachonica*, and may perhaps belong to *D. minor*, H. Gervais and Ameghino, with which it agrees in the strongly developed third lobe of the last upper molar. The length of the space occupied by the series of cheek-teeth is 0,0207.
Bravard Collection. Purchased, 1854.

Dolichotis, sp. 2.

Hab. S. America.

40675 d. The right ramus of the mandible of a species somewhat larger than the last; from the Pleistocene of Buenos Ayres. The length of the space occupied by the series of cheek-teeth is 0,0225.
Bravard Collection. Purchased, 1854.

40675 e, f. Detached teeth and limb-bones, which may belong to one or other of the foregoing species; from the Pleistocene of Buenos Ayres. *Bravard Collection. Purchased*, 1854.

Genus **HYDROCHŒRUS**, Erxl.[3] (*ex* Brisson).

Hydrochœrus capybara, Erxl.[4]

Syn. (?) *Hydrochœrus affinis capybara*, Lund.

Hab. S. America.

18925. Portion of an incisor; from a cavern in Minas Geraes, Brazil. This specimen agrees exactly in size with the incisor of the living form, with which the so-called *H. affinis capybara*[5], Lund, may in all probability be united.
Claussen Collection. Purchased, 1845.

[1] Mammalogie, p. 360 (1822).
[2] Mammifères fossiles de l'Amérique du Sud, p. 47 (1880).
[3] Syst. Regn. Animal. p. 191 (1777). [4] *Op. cit.* p. 193.
[5] *Vide* H. Gervais and Ameghino, 'Mammifères fossiles de l'Amérique du Sud,' p. 43 (1880).

Suborder *RODENTIA DUPLICIDENTATA.*

Incisors $\frac{2}{1}$, at birth $\frac{3}{1}$; the outer upper incisors soon lost; the next pair very small, and placed directly behind the large middle pair.

Family LAGOMYIDÆ.

Genus **LAGOMYS**, Cuvier[1].

Syn. *Titanomys*, H. v. Meyer[2].
Amphilagus, Pomel[3].
Myolagus, Hensel[4].

Dentition:—In the existing species the formula of the cheek-dentition is Pm. $\frac{2}{2}$, M. $\frac{3}{3}$. In certain fossil forms, however, to which Pomel (*loc. cit.*) gave the name *Amphilagus*, the penultimate lower premolar is very minute; while in others, for which Hensel has proposed the name *Myolagus*, it is wanting. In another group, forming Meyer's genus *Titanomys* (but including *Amphilagus*), the penultimate premolar is normally wanting in both jaws. As there is such a gradual and complete transition from the typical *Lagomys* to the so-called *Titanomys*, it seems inadvisable to retain the three genera *Lagomys*, *Myolagus*, and *Titanomys*; and all the forms are accordingly grouped under the type genus. It is remarkable that it is the newer forms which retain the penultimate premolar.

Lagomys pusillus (Pallas[5]).

Syn. *Lepus pusillus*, Pallas[6].
Lagomys spelæus, Owen[7].

The so-called *L. spelæus*, Owen, is considered by Sanford (Quart. Journ. Geol. Soc. vol. xxvi. p. 126) to be in all probability identical with the existing Siberian *L. pusillus*. The penultimate premolar is minute.

Hab. N. Asia and Europe.

48886. (*Fig.*) Anterior portion of the cranium, showing the incisors and most of the cheek-teeth; from Kent's Hole Cavern, Torquay. This specimen is described and figured by Owen in the Brit. Foss. Mamm. and Birds, p. 213, figs. 82–4, under the name of *Lagomys spelæus*, of which it is the type. *McEnery Collection. Purchased*, 1842.

[1] Tabl. Elém. d. Hist. Nat. p. 132 (1798).
[2] Neues Jahrb. 1843, p. 393.
[3] Catalogue Méthodique, p. 42 (1853).
[4] Zeitschr. deutsch. geol. Ges. vol. viii. p. 688 (1856).
[5] Nov. Comm. Petrop. vol. xiii. p. 531 (before 1778), *Lepus*. [6] *Loc. cit.*
[7] British Fossil Mammals and Birds, p. 213 (1846).

48886. Palatal portion of the cranium; from Brixham Cave, near Torquay. The length of the space occupied by the five cheek-teeth in this specimen is 0,0077, and 0,0078 in the preceding specimen.

Brixham-Cave Collection. Presented, 1876.

Lagomys sardus (Hensel[1]).

Syn. *Myolagus sardus*, Hensel[2].
Lagomys corsicanus, P. Gervais[3].

This species is considerably larger than the last, the length of the space occupied by the five upper cheek-teeth varying from 0,0085 to 0,0115. The penultimate upper premolar is large, but the corresponding lower tooth is absent; thus showing its distinctness from all the existing species. The limb-bones agree in size with those of *L. œningensis*.

Hab. Sardinia and Corsica.

32333. Several fragments of the maxilla and rami of the mandible; from the Pleistocene breccia of Sardinia.

Buckland Collection. Purchased.

32333 a. Several specimens of the scapula, humerus, innominate, femur, and tibia; from the Pleistocene of Sardinia.

Buckland Collection. Purchased.

Lagomys œningensis, H, v. Meyer[4].

Syn. *Lagomys verus*, Hensel[5].

This is a large-sized species. In one of the specimens figured by Von Meyer the last lower true molar is wanting.

Hab. Europe.

42815. The skeleton, in a much-crushed and imperfect condition; from the Upper Miocene of Œningen. This specimen agrees very closely in size with the one figured by Von Meyer in the 'Fossile Säugethiere etc. von Œningen,' pl. iii. fig. 1. The length of the scapula is 0,032, and that of the femur 0,046. *Van Breda Collection. Purchased*, 1871.

42816. The bones of the hind limb; from the Upper Miocene of Œningen. The length of the femur is the same as in the last specimen, that of the tibia being 0,0500.

Van Breda Collection. Purchased, 1871.

[1] Zeitschr. deutsch. geol. Ges. vol. viii. p. 689 (1856), *Myolagus*.
[2] *Loc. cit.* [3] Zool. et Pal. Françaises, 2nd ed. p. 50 (1859).
[4] Neues Jahrb. 1836, p. 58.
[5] Zeitschr. deutsch. geol. Ges. vol. viii. p. 688 (1856).

42820. The bones of the hind limb; from the Upper Miocene of Œningen. *Van Breda Collection. Purchased*, 1871.

Lagomys meyeri, Tschudi[1].

Syn. *Anœma œningensis*, Kœnig[2].
Lagomys sansaniensis, Lartet[3] (*teste* Schlosser).
Myolagus meyeri, Fraas[4].

This species is smaller than the last; the penultimate premolar is absent in the mandible.

Hab. Europe.

43195, 43189. Two specimens of the cranium and a fragment of the mandible; from the Middle (?) Miocene of Hahnenberg, Bavaria. These specimens appear to agree exactly with the skull figured by Fraas in the 'Fauna von Steinheim,' pl. ii. fig. 2, under the name of *Myolagus meyeri*. The palate of both specimens is concealed by matrix.
Purchased, 1877.

42819. Palatal aspect of the cranium, in a much-crushed condition; from the Upper Miocene of Œningen. This specimen is slightly smaller than the two last, and agrees very closely with one figured by Fraas in fig. 4 of the plate cited.
Van Breda Collection. Purchased, 1871.

42819 a. (*Fig.*) The skeleton, in a crushed condition; from the Upper Miocene of Œningen. This specimen is figured by Kœnig, *loc. cit.*; it agrees very closely with the one figured by H. von Meyer in the 'Fossile Säugethiere von Œningen,' pl. iii. fig. 2. The length of the femur is 0,032 (or thereabouts), and that of the tibia 0,034.
Sömmering Collection. Purchased, 1827.

42818. Part of a much-crushed skeleton, probably belonging to the present species; from the Upper Miocene of Œningen. The length of the femur is very nearly the same as in the last specimen. *Van Breda Collection. Purchased*, 1871.

[1] In H. v. Meyer's 'Fossile Säugethiere &c. von Œningen,' p. 7 (1845).
[2] Icones Fossilium Sectiles, pl. x. fig. 126 (about 1825). This name has the priority over Tschudi's; but the latter is generally adopted for this species.
[3] Notice sur la Colline de Sansan, p. 21 (1851).
[4] Fauna von Steinheim, p. 10 (1870).

42817. The cranium, in a crushed condition; from the Upper Miocene of Œningen. *Van Breda Collection. Purchased*, 1871.

48195 a. The right ramus of the mandible; from the Middle Miocene of Steinheim, Bavaria. This specimen agrees precisely with the one figured by Fraas in the 'Fauna von Steinheim,' pl. ii. fig. 5, under the name of *Myolagus meyeri*. *Purchased*, 1877.

42825. Some of the bones of the two hind limbs, in a much-crushed condition; from the Upper Miocene of Œningen. *Van Breda Collection. Purchased*, 1871.

47864. Numerous broken limb-bones, cemented together by a calcareous incrustation; from the Middle (?) Miocene of Hahnenberg, Bavaria. *Presented by Herr von Bezold*, 1873.

42822. The much-crushed cranium of a very small *Lagomys*, which may belong to a young individual of the present species; from the Upper Miocene of Œningen. *Van Breda Collection. Purchased*, 1871.

33267. Five cheek-teeth, the calcaneum, part of the humerus, and the radius; from the Middle Miocene of Sansan (Gers), France. These specimens belong to Lartet's *M. sansaniensis*, which Schlosser identifies with the present species, although, in the original description, it is stated that $\overline{\text{pm. 3}}$ is absent. *Presented by M. Ed. Lartet.*

Lagomys visenoviensis (H. von Meyer[1]).

Syn. *Titanomys visenoviensis*, H. von Meyer[2].
Lagomys trilobus, P. Gervais[3].
Lagomys picoides, Pomel[4].
(?) *Amphilagus antiquus*, Pomel[5].

A small species, in which the penultimate premolar is absent in both jaws. P. Gervais identifies Pomel's *Amphilagus antiquus* with this species. In the description of that species (Cath. Méth. p. 43) it is stated that $\overline{\text{pm. 3}}$ was present and $\overline{\text{m. 3}}$ minute and caducous.

Hab. Europe.

[1] Neues Jahrb. 1843, p. 393, *Titanomys*. [2] *Loc. cit.*
[3] Zool. et Pal. Françaises, 1st ed. pl. xlvi. (1848–52).
[4] Catalogue Méthodique, p. 42 (1853). [5] *Ibid.* p. 43.

26715. Fragment of the right ramus of the mandible, showing the three true molars; from the Lower Miocene of Allier, France. *Pomel Collection. Purchased*, 1851.

26716. Fragment of the left ramus of the mandible, containing all the cheek-teeth; from the Lower Miocene of Allier. *Pomel Collection. Purchased*, 1851.

31094–104. Several fragments of the mandible and limb-bones; from the Lower Miocene of Allier. *Bravard Collection. Purchased*, 1852.

21495. Fragments of the mandible, and detached teeth; from the Lower Miocene of Weissenau, Germany. These specimens are mentioned by P. Gervais in the Zool. et Pal. Françaises, 2nd ed. p. 50. *Purchased*, 1847.

41085. Impression of the skeleton; from the Lower-Miocene Brown Coal of Rott, near Bonn. *Purchased*, 1868.

Family LEPORIDÆ.

Dentition:—I. $\frac{2}{1}$, C. $\frac{0}{0}$, Pm. $\frac{2}{2}$, M. $\frac{3}{3}$.

Genus **LEPUS**, Linn.[1]

Lepus timidus, Linn.[2]

Syn. *Lepus europæus*, Pallas[3].

Hab. Europe.

57 (O. C.). (*Fig.*) The greater portion of the right ramus of the mandible; from Kirkdale Cave, Yorkshire. This specimen is figured in Buckland's 'Reliquiæ Diluvianæ,' pl. xiii. fig. 8. (?) *Presented by W. Salmond, Esq. Before* 1836.

15039. (*Fig.*) The greater portion of the left ramus of the mandible; from Kent's-Hole Cavern, Torquay. This specimen is figured by Owen in the 'British Fossil Mammals and Birds,' p. 210, fig. 80. *McEnery Collection. Purchased*, 1842.

[1] Syst. Nat. ed. 12, vol. i. p. 77 (1766).
[2] *Loc. cit.*
[3] Nov. Spec. Glirium, p. 30 (1778).

15091. The greater portion of the right ramus of the mandible, containing the last two molars; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

48909. Two broken rami of the mandible; from Brixham Cave, near Torquay. *Brixham-Cave Collection. Presented*, 1876.

48910. The greater portion of the left scapula; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

48909 a. The left innominate; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

48909 b, 48911. Two specimens of the right femur, wanting the epiphyses; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

48911 a. The sacrum; from Brixham Cave. *Brixham-Cave Collection. Presented*, 1876.

16713. Four specimens of the innominate (broken); from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

44772. The proximal extremity of the right femur; from Kirkdale Cave. *Presented by Benjamin Bright, Esq.*, 1873.

16752. The associated metatarsals; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

16752 a. Three specimens of the calcaneum; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

17764. The calcaneum; from the Forest-bed of Ostend, near Bacton, Norfolk. *Green Collection. Purchased*, 1843.

16757–8. Three imperfect specimens of the tibia; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

Lepus lacosti, Pomel[1].

This species is intermediate in size between *L. tumidus* and *L. cuniculus*; but is nearest in structure to the last.

Hab. Europe.

[1] Catalogue Méthodique, p. 47 (1853).

27618, 36952. Two imperfect specimens of the left ramus of the mandible, containing the whole of the dentition; from the Upper Pliocene of Perrier (Puy-de-Dôme), France. The length of the space occupied by the five cheek-teeth is 0,016. *Bravard Collection. Purchased*, 1852.

34952–6. The humerus, femur, tibia, and part of the innominate; from the Pliocene of Perrier. The length of the humerus is 0,080, and that of the tibia 0,123; the corresponding dimensions of Pomel's type-specimens being 0,078 and 0,120. *Bravard Collection. Purchased*, 1852.

Lepus braziliensis, Linn.[1]

Syn. *Lepus tapeti*, Pallas[2].
Lepus affinis braziliensis, Lund.

Hab. S. America.

18904. The cranium, wanting the zygomatic arches and part of the premaxillæ; from a cavern in Minas Geraes, Brazil. This specimen is noticed by Waterhouse in the 'Natural History of the Mammalia,' vol. ii. pp. 144, 145, who observes that it is distinguished from the existing form merely by its slightly superior size.
Claussen Collection. Purchased, 1845.

18905. Specimens of the palate and rami of the mandible; from the caverns of Minas Geraes, Brazil.
Claussen Collection. Purchased, 1845.

Lepus cuniculus, Linn.[3]

Hab. Europe.

From its burrowing habits Sanford (Quart. Journ. Geol. Soc. vol. xxvi. p. 128) is strongly inclined to doubt the contemporaneity of the Rabbit with the proper members of the Cave-fauna of England. All the bones noticed below are in a comparatively fresh condition.

15089. The greater portion of the right ramus of the mandible; (*Fig.*) from Kent's-Hole Cavern, Torquay. This specimen is

[1] Syst. Nat. ed. 12, vol. i. p. 78 (1766).
[2] Nov. Spec. Glirium, p. 30 (1778).
[3] Syst. Nat. ed. 12, vol. i. p. 77 (1766).

figured by Owen in the 'British Fossi Mammals and Birds,' p. 212, fig. 81.

McEnery Collection. Purchased, 1842.

15089 a. Three broken rami of the mandible; from Kent's-Hole Cavern, Torquay. *McEnery Collection. Purchased*, 1842.

15089 b. The humerus and part of the femur and tibia; from Kent's-Hole Cavern. *McEnery Collection. Purchased*, 1842.

48908. The greater portion of the skeleton; from Brixham Cave, near Torquay. *Brixham-Cave Collection. Presented*, 1876.

Lepus, sp.

Hab. India.

16529. Fragment of the mandible, containing two cheek-teeth; from the Pliocene of the Siwalik Hills, India. This specimen is noticed by the present writer in the 'Palæontologia Indica' (Mem. Geol. Surv. Ind.), ser. 10, vol. iii. p. 126. It is insufficient for specific determination.

Cautley Collection. Presented, 1842.

ADDENDUM.

The following specimens were not observed till earlier sheets were printed off:—

Order PRIMATES.

Genus **ADAPIS** (page 8).

Adapis magna, Filhol[1].

This species is of larger size than *A. parisiensis*: it has hitherto been recorded only from the Upper Eocene of the Continent.

Hab. Europe.

[1] Ann. Sci. Géol. vol. v. art. 4, p. 1 (1874).

30346 a. Seven upper true molars, one upper premolar, and two lower true molars; from the Headon beds (Upper Eocene) of Hordwell, Hampshire. Some of these teeth, as well as those of the succeeding specimens, are slightly larger than any of those noticed by Filhol in the Ann. Sci. Géol. vol. viii. art. 1, pp. 87–103.

Hastings Collection. *Purchased*, 1855.

29741. Part of the right ramus of the mandible, containing the canine and four cheek-teeth; from the Headon beds of Hordwell. *Hastings Collection.* *Purchased*, 1855.

30323. Fragment of the right ramus of the mandible, with the three true molars; from the Headon beds of Hordwell.

Hastings Collection. *Purchased*, 1855.

30856. Fragment of the right ramus of the mandible, with $\overline{\text{m. 2}}$ and $\overline{\text{m. 3}}$; from the Headon beds of Hordwell.

Hastings Collection. *Purchased*, 1855.

29864. Fragment of the right ramus of the mandible, with $\overline{\text{pm. 4}}$ and $\overline{\text{m. 1}}$; from the Headon beds of Hordwell.

Hastings Collection. *Purchased*, 1855.

Order RODENTIA.

Genus **CASTOR** (page 216).

Castor canadensis, Kuhl[1].

Hab. North America.

M. 1958. Part of the left ramus of the mandible, with the first three cheek-teeth; from the Pleistocene of Owyhee, Rocky Mountains. *Presented by Sir R. Owen, K.C.B.*, 1884.

[1] Beiträge z. Zoologie, p. 64 (1820).

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